SUZUKI

AN650/A

SUPPLEMENTARY SERVICE MANUAL

USE THIS MANUAL WITH:
AN650 SERVICE MANUAL (99500-36111-01E)

SAMPLE

99501-36110-01E

AN650/AK5 ('05-MODEL)

This manual describes service data, service specifications, ABS and servicing procedures which differ from those of the AN650K3 ('03-model) and AN650AK4 ('04-model).

NOTE:
- *Any differences between the AN650K3 ('03-model) and AN650K5 ('05-model), AN650AK4 ('04-model) and AN650AK5 ('05-model) in specifications and service data are indicated with an asterisk mark (*).*
- *Please refer to the AN650K3 ('03-model) service manual and AN650AK4 ('04-model) service information for details which are not given in this manual.*

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SAMPLE

COUNTRY AND AREA CODES

The following codes stand for the applicable country(-ies) and area(-s).

CODE		COUNTRY or AREA	EFFECTIVE FRAME NO.
AN650K5	E-03 E-28 E-33	U.S.A. Canada California (U.S.A.)	JS1CP51A52 100001 –
	E-02	U.K.	JS1BU111200100468 –
	E-19	E.U.	JS1BU111100113619 –
	E-24	Australia	JS1BU121300100200 –
	000	JAPAN	* * * * *
AN650AK5	E-02	U.K.	JS1BU132200100080 –
	E-19	E.U.	JS1BU132100105119 –
	000	JAPAN	* * * * *

SAMPLE

SPECIFICATION (AN650K5)

DIMENSIONS AND DRY MASS

Overall length		2 260 mm (89.0 in)
Overall width		810 mm (31.9 in)
Overall height		1 435 mm (56.5 in)
Wheelbase		1 595 mm (62.8 in)
Ground clearance		130 mm (5.1 in)
Seat height		750 mm (29.5 in)
Dry mass	*	235 kg (518 lbs)

ENGINE

Type	4-stroke, liquid-cooled, DOHC
Number of cylinders	2
Bore	75.5 mm (2.972 in)
Stroke	71.3 mm (2.807 in)
Displacement	638 cm^3 (38.9 cu. in)
Compression ratio	11.2 : 1
Carburetion	Fuel injection
Air cleaner	Non-woven fabric element
Starter system	Electric
Lubrication system	Wet sump
Idle speed	1 200 ± 100 r/min

DRIVE TRAIN

Clutch	Wet multi-plate, automatic, centrifugal type
Primary reduction ratio	1.333 (88/66)
Gearshift pattern	Automatic & Manual shift
Automatic transmission ratio	Variable change (1.800 – 0.465)
Final reduction ratio	1.580 (32/31 × 31/32 × 34/31 × 49/34)
Drive system	Gear drive

CHASSIS

Front suspension	Telescopic, coil spring, oil damped
Rear suspension	Swingarm type, coil spring, oil damped
Front fork stroke	110 mm (4.3 in)
Rear wheel travel	100 mm (3.9 in)
Caster	26° 10'
Trail	106 mm (4.17 in)
Steering angle	41° (right and left)
Turning radius	2.7 m (8.9 ft)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	120/70R15M/C 56H, tubeless
Rear tire size	160/60R14M/C 65H, tubeless

ELECTRICAL

Ignition type		Electronic ignition (Transistorized)	
Ignition timing		10° B.T.D.C. at 1 200 r/min	
Spark plug		NGK CR8E or DENSO U24ESR-N	
Battery		12 V 43.2 kC (12 Ah)/10 HR	
Generator		Three-phase A.C. generator	
Main fuse		40 A	
CVT fuse		40 A	
Fuse		15/15/15/15/10/10/10 A	E-02, 19
		15/15/15/15/15/10/10 A	E-03, 24, 28, 33
Headlight		12 V 60 + 55/55 + 55 (H4 + H7)	E-02, 19
		12 V 60/55 W × 2 (H4 × 2)	E-03, 24, 28, 33
Position/parking light		12 V 5 W	E-02, 19
Brake light/Taillight		12 V 21/5 W × 2	
License plate light		12 V 5 W	
Trunk light		12 V 5 W	
Turn signal light		12 V 21 W	
Instrument panel light		12 V 1.4 W × 2	
Coolant temperature warning light		12 V 1.4 W	
Fuel injection warning light		12 V 1.4 W	
Oil pressure warning light		12 V 1.4 W	
Brake-lock warning light		12 V 1.4 W	
High beam indicator light		12 V 1.4 W	
Turn signal indicator light		12 V 1.4 W × 2	
Power mode indicator light		12 V 1.4 W	
Drive indicator light		12 V 1.4 W	
Gear position indicator light		12 V 1.4 W × 5	
Immobilizer indicator light	*	LED	E-02, 19
Over drive indicator light	*	12 V 1.4 W	E-02, 19

CAPACITIES

Fuel tank, including reserve		15.0 L (4.0/3.3 US/Imp gal)
Engine oil, oil change		2 600 ml (2.7/2.3 US/Imp qt)
with filter change		2 900 ml (3.1/2.6 US/Imp qt)
overhaul		3 400 ml (3.6/3.0 US/Imp qt)
Transmission oil, oil change		360 ml (12.2/12.7 US/Imp oz)
overhaul		400 ml (13.5/14.1 US/Imp oz)
Final gear oil, oil change		300 ml (10.1/10.6 US/Imp oz)
overhaul		430 ml (14.5/15.1 US/Imp oz)
Coolant		1.6 L (1.7/1.4 US/Imp qt)

SAMPLE

SPECIFICATION (AN650AK5)

DIMENSIONS AND DRY MASS

Overall length		2 260 mm (89.0 in)
Overall width		810 mm (31.9 in)
Overall height		1 435 mm (56.5 in)
Wheelbase		1 595 mm (62.8 in)
Ground clearance		130 mm (5.1 in)
Seat height		750 mm (29.5 in)
Dry mass	*	243 kg (535 lbs)

ENGINE

Type	4-stroke, liquid-cooled, DOHC
Number of cylinders	2
Bore	75.5 mm (2.972 in)
Stroke	71.3 mm (2.807 in)
Displacement	638 cm^3 (38.9 cu. in)
Compression ratio	11.2 : 1
Carburetion	Fuel injection
Air cleaner	Non-woven fabric element
Starter system	Electric
Lubrication system	Wet sump
Idle speed	1 200 ± 100 r/min

DRIVE TRAIN

Clutch	Wet multi-plate, automatic, centrifugal type
Primary reduction ratio	1.333 (88/66)
Gearshift pattern	Automatic & Manual shift
Automatic transmission ratio	Variable change (1.800 – 0.465)
Final reduction ratio	1.580 (32/31 × 31/32 × 34/31 × 49/34)
Drive system	Gear drive

CHASSIS

Front suspension	Telescopic, coil spring, oil damped
Rear suspension	Swingarm type, coil spring, oil damped
Front fork stroke	110 mm (4.3 in)
Rear wheel travel	100 mm (3.9 in)
Caster	26° 10'
Trail	106 mm (4.17 in)
Steering angle	41° (right and left)
Turning radius	2.7 m (8.9 ft)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	120/70R15M/C 56H, tubeless
Rear tire size	160/60R14M/C 65H, tubeless

ELECTRICAL

Ignition type		Electronic ignition (Transistorized)
Ignition timing		10° B.T.D.C. at 1 200 r/min
Spark plug		NGK CR8E or DENSO U24ESR-N
Battery		12 V 43.2 kC (12 Ah)/10 HR
Generator		Three-phase A.C. generator
Main fuse		40 A
CVT fuse		40 A
Fuse		15/15/15/15/15/10/10/15/15 A
Headlight		12 V 60 + 55/55 + 55 (H4 + H7)
Position/parking light		12 V 5 W
Brake light/Taillight		12 V 21/5 W × 2
License plate light		12 V 5 W
Trunk light		12 V 5 W
Turn signal light		12 V 21 W
Instrument panel light		12 V 1.4 W
Coolant temperature warning light		12 V 1.4 W
Fuel injection warning light		12 V 1.4 W
Oil pressure warning light		12 V 1.4 W
Brake-lock warning light		12 V 1.4 W
High beam indicator light		12 V 1.4 W
Turn signal indicator light		12 V 1.4 W
Power mode indicator light		12 V 1.4 W
Drive indicator light		12 V 1.4 W
Gear position indicator light		12 V 1.4 W
ABS warning light		12 V 1.4 W
Immobilizer indicator light	*	LED
Over drive indicator light	*	12 V 1.4 W

CAPACITIES

Fuel tank, including reserve		15.0 L (4.0/3.3 US/Imp gal)
Engine oil, oil change		2 600 ml (2.7/2.3 US/Imp qt)
with filter change		2 900 ml (3.1/2.6 US/Imp qt)
overhaul		3 400 ml (3.6/3.0 US/Imp qt)
Transmission oil, oil change		360 ml (12.2/12.7 US/Imp oz)
overhaul		400 ml (13.5/14.1 US/Imp oz)
Final gear oil, oil change		300 ml (10.1/10.6 US/Imp oz)
overhaul		430 ml (14.5/15.1 US/Imp oz)
Coolant		1.6 L (1.7/1.4 US/Imp qt)

SAMPLE

SERVICE DATA (AN650K5)

VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	29.5 (1.16)	—
	EX.	25.0 (0.98)	—
Tappet clearance (when cold)	IN.	0.10 – 0.20 (0.0039 – 0.0079)	—
	EX.	0.20 – 0.30 (0.0079 – 0.0118)	—
Valve guide to valve stem clearance	IN.	0.010 – 0.040 (0.0004 – 0.0016)	—
	EX.	0.030 – 0.060 (0.0012 – 0.0024)	—
Valve guide I.D.	IN. & EX.	4.500 – 4.515 (0.1772 – 0.1778)	—
Valve stem O.D.	IN.	4.475 – 4.490 (0.1762 – 0.1768)	—
	EX.	4.455 – 4.470 (0.1754 – 0.1760)	—
Valve stem deflection	IN. & EX.	—	0.35 (0.014)
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve head thickness	IN. & EX.	—	0.5 (0.02)
Valve seat width	IN. & EX.	0.9 – 1.1 (0.035 – 0.043)	—
Valve head radial runout	IN. & EX.	—	0.03 (0.001)
Valve spring free length (IN. & EX.)	IN. & EX.	—	40.6 (1.60)
Valve spring tension (IN. & EX.)	IN. & EX.	136 – 156 N (13.6 – 15.6 kgf, 30.0 – 34.4 lbs) at length 33.4 mm (1.31 in)	—

SAMPLE

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM	STANDARD		LIMIT
Cam height	IN.	35.38 – 35.43 (1.393 – 1.395)	35.10 (1.382)
	EX.	33.98 – 34.03 (1.338 – 1.340)	33.70 (1.327)
Camshaft journal oil clearance	IN. & EX.	0.032– 0.066 (0.0013 – 0.0026)	0.150 (0.0059)
Camshaft journal holder I.D.	IN. & EX.	24.012 – 24.025 (0.9454 – 0.9459)	—
Camshaft journal O.D.	IN. & EX.	23.959 – 23.980 (0.9433 – 0.9441)	—
Camshaft runout	IN. & EX.	—	0.10 (0.004)
Cam chain pin (at arrow "3")	15th pin		—
Cylinder head distortion	—		0.10 (0.004)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure	1 500 – 1 900 kPa (15.0 – 19.0 kgf/cm², 213 – 270 psi)			1 200 kPa (12 kgf/cm², 171 psi)
Compression pressure difference	—			200 kPa (2.0 kgf/cm², 28 psi)
Piston to cylinder clearance	0.045 – 0.055 (0.0018 – 0.0022)			0.120 (0.0047)
Cylinder bore	75.500 – 75.515 (2.9724 – 2.9730)			Nicks or scratches
Piston diam.	* 75.470 – 75.485 (2.9705 – 2.9711) Measure at 15 mm (0.6 in) from the skirt end.			75.380 (2.9677)
Cylinder distortion	—			0.10 (0.004)
Piston ring free end gap	1st	R	Approx. 11.6 (0.46)	9.3 (0.37)
	2nd	RN	Approx. 8.6 (0.34)	6.9 (0.27)
Piston ring end gap	1st		* 0.06 – 0.18 (0.002 – 0.005)	0.50 (0.020)
	2nd		* 0.06 – 0.18 (0.002 – 0.005)	0.50 (0.020)
Piston ring to groove clearance	1st		—	0.180 (0.007)
	2nd		—	0.150 (0.006)
Piston ring groove width	1st		1.01 – 1.03 (0.040 – 0.041)	—
	2nd		1.01 – 1.03 (0.040 – 0.041)	—
	Oil		2.01 – 2.03 (0.079 – 0.080)	—

SAMPLE

ITEM	STANDARD		LIMIT
Piston ring thickness	1st	0.97 – 0.99 (0.038 – 0.039)	—
	2nd	0.97 – 0.99 (0.038 – 0.039)	—
Piston pin bore	16.002 – 16.008 (0.6300 – 0.6302)		16.030 (0.6311)
Piston pin O.D.	15.995 – 16.000 (0.6297 – 0.6299)		15.980 (0.6291)

CONROD + CRANKSHAFT

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	16.010 – 16.018 (0.6303 – 0.6306)	16.040 (0.6315)
Conrod big end side clearance	0.10 – 0.20 (0.004 – 0.008)	0.30 (0.012)
Conrod big end width	19.950 – 20.000 (0.7854 – 0.7874)	—
Crank pin width	20.100 – 20.150 (0.7913 – 0.7933)	—
Conrod big end oil clearance	0.032 – 0.056 (0.0013 – 0.0022)	0.080 (0.0031)
Crank pin O.D.	44.976 – 45.000 (1.7707 – 1.7717)	—
Crankshaft journal oil clearance	0.018 – 0.045 (0.0007 – 0.0018)	0.080 (0.0031)
Crankshaft journal O.D.	47.985 – 48.000 (1.8892 – 1.8898)	—
Crankshaft thrust bearing thickness	2.025 – 2.175 (0.0797 – 0.0856)	—
Crankshaft thrust clearance	0.10 – 0.15 (0.0039 – 0.0059)	—
Crankshaft runout	—	0.05 (0.002)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pressure (at 60 °C, 140 °F)	Above 350 kPa (3.5 kgf/cm^2, 49.8 psi) Below 550 kPa (5.5 kgf/cm^2, 78.2 psi) at 3 000 r/min	—

SAMPLE

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Drive plate thickness	2.92 – 3.08 (0.115 – 0.121)	2.62 (0.103)
Drive plate claw width	13.85 – 13.96 (0.545 – 0.550)	13.05 (0.514)
Driven plate No. 2 thickness	2.42 – 2.58 (0.095 – 0.102)	2.27 (0.089)
Driven plate distortion	—	0.10 (0.004)
Clutch spring free length	13.9 (0.547)	13.2 (0.520)
Clutch plate concaved washer height	3.2 (0.126)	3.1 (0.12)
Clutch engagement	1 500 – 2 100 r/min	—
Clutch lock-up	3 200 – 3 800 r/min	—

INJECTOR + FUEL PUMP + FUEL PRESSURE REGULATOR

ITEM	SPECIFICATION	NOTE
Injector resistance	11 – 13 Ω at 20 °C (68 °F)	—
Fuel pump discharge amount	More than 0.9 L (0.95/0.79 US/Imp qt) For 30 sec. at 300 kPa (3.0 kgf/cm², 43 psi)	—
Fuel pressure regulator operating set pressure	Approx. 300 kPa (3.0 kgf/cm², 43 psi)	—

FI/CVT-SENSORS

ITEM	SPECIFICATION		NOTE
CMP sensor resistance	0.9 – 1.7 kΩ		
CMP sensor peak voltage	More than 0.5 V (When cranking)		⊕: B/Y, ⊖: Br
CKP sensor resistance	150 – 300 Ω		
CKP sensor peak voltage	More than 2.0 V (When cranking)		⊕: Bl, ⊖: G
IAP sensor input voltage	4.5 – 5.5 V		
IAP sensor output voltage	Approx. 2.6 V at idle speed		
TP sensor input voltage	4.5 – 5.5 V		
TP sensor resistance	Closed	Approx. 1.1 kΩ	
	Opened	Approx. 4.2 kΩ	
TP sensor output voltage	Closed	Approx. 1.1 V	
	Opened	Approx. 4.3 V	
ECT sensor input voltage	4.5 – 5.5 V		
ECT sensor resistance	Approx. 2.45 kΩ at 20 °C (68 °F)		
IAT sensor input voltage	4.5 – 5.5 V		
IAT sensor resistance	Approx. 2.45 kΩ at 20 °C (68 °F)		
AP sensor input voltage	4.5 – 5.5 V		
AP sensor output voltage	Approx. 3.6 V at 100 kPa (760 mmHg)		
TO sensor resistance	19.1 – 19.7 kΩ		
TO sensor output voltage	Normal	0.4 – 1.4 V	⊕: B, ⊖: B/Br
	Leaning	3.7 – 4.4 V	⊕: B, ⊖: B/Br
Injector voltage	Battery voltage		

SAMPLE

ITEM	SPECIFICATION		NOTE
Ignition coil primary peak voltage	More than 80 V (When cranking)		#1 ⊕: W/Bl, ⊖: Ground #2 ⊕: B/Y, ⊖: Ground
HO2 sensor resistance	4 – 5 Ω at 23 °C (73.4 °F)		
HO2 sensor output voltage	Idle speed	Less than 0.4 V	
	3 000 r/min	More than 0.6 V	
PAIR solenoid valve resistance	20 – 24 Ω at 20 °C (68 °F)		
CVT primary pulley position sensor	Compressed	1.9 – 2.3 kΩ	
	Extended	0.2 – 1.0 kΩ	
CVT primary pulley position sensor output voltage	1st: Idle speed	Approx. 3.3 V	
	3rd: 3 000 r/min	Approx. 1.3 V	
	5th: 3 000 r/min	Approx. 0.5 V	
CVT secondary pulley revolution sensor resistance	400 – 600 Ω		
CVT secondary pulley revolution sensor peak voltage	More than 5 V at idle speed		⊕: Y, ⊖: W

THROTTLE BODY

ITEM	SPECIFICATION
I.D. No.	10GO
Bore size	32 mm (1.26 in)
Fast idle r/min	1 300 – 1 600 r/min
Idle r/min	1 200 ± 100 r/min
Synchronizing screw opening	1 and 1/2 turns out
IAC valve resistance	Approx. 4 Ω at 20 – 24 °C (68 – 75 °F)
Throttle cable play	2.0 – 4.0 mm (0.08 – 0.16 in)

SAMPLE

THERMOSTAT + RADIATOR + FAN + COOLANT

ITEM	STANDARD/SPECIFICATION		LIMIT
Thermostat valve opening temperature	Approx. 88 °C (190 °F)		—
Thermostat valve lift	Over 8.0 mm (0.3 in) at 100 °C (212 °F)		—
Engine coolant temperature sensor resistance	20 °C (68 °F)	Approx. 2.45 kΩ	—
	50 °C (122 °F)	Approx. 0.811 kΩ	—
	80 °C (176 °F)	Approx. 0.318 kΩ	—
	110 °C (230 °F)	Approx. 0.142 kΩ	—
Radiator cap valve opening pressure	110 kPa (1.1 kgf/cm²)		—
Eclectic fan thermo-switch operating temperature	ON	93 – 103 °C (199 – 217 °F)	—
	OFF	87 – 97 °C (188 – 206 °F)	—
Engine coolant type	Use an anti-freeze/coolant compatible with aluminum radiator, mixed with distilled water only, at the ratio of 50:50.		—

ITEM	STANDARD/SPECIFICATION		LIMIT
Engine coolant including reserve	Reverse tank side	Approx. 250 ml (0.264/0.220 US/Imp qt)	—
	Engine side	Approx. 1 350 ml (1.427/1.188 US/Imp qt)	—

ELECTRICAL

Unit: mm (in)

ITEM	STD/SPEC.		NOTE
Firing order	1·2		
Spark plug	Type	NGK: CR8E DENSO: U24ESR-N	
	Gap	0.7 – 0.8 (0.028 – 0.031)	
Spark performance	Over 8.0 (0.3) at 1 atm.		
CKP sensor peak voltage	More than 2.0 V		⊕: Bl, ⊖:G
Ignition coil resistance	Primary	0.8 – 2.5 Ω	
	Secondary	8 – 18 kΩ	
Ignition coil primary peak voltage	More than 80 V		#1 ⊕: W/Bl, ⊖: Ground #2 ⊕: B/Y, ⊖: Ground
Generator coil resistance	CKP sensor	150 – 300 Ω	G – Bl
	Charging	0.1 – 1.0 Ω	Y – Y
Generator no-load voltage (When cold)	More than 50 V at 5 000 r/min		
Generator Max. output	Approx. 500 W at 5 000 r/min		
Regulated voltage	14.0 – 15.5 V at 5 000 r/min		
Starter relay resistance	3 – 6 Ω		
Battery	Type designation	FTX14-BS	
	Capacity	12 V 43.2 kC (12 Ah)/10 HR	
Fuse size	Head-light LO	15 A ..... E-03, 24, 28, 33 10 A E-02, 19	
	Head-light HI	15 A	
	Fuel pump	10 A	
	Ignition	15 A	
	Turn signal	15 A	
	Fan motor	15 A	
	Main	40 A	
	CVT	40 A	
	Power source	10 A	

SAMPLE

WATTAGE

Unit: W

ITEM		STD/SPEC.	
		E-02, 19	E-03, 24, 28, 33
Headlight	HI	60 + 55	60 × 2
	LO	55	55 × 2
Parking or position light		5 × 2	
Brake light/Taillight		21/5 × 2	←
Turn signal light		21 × 4	←
License light		5	←
Instrument panel light		1.4 × 2	←
Engine coolant temp. indicator light		1.4	←
FI indicator light		1.4	←
Engine oil pressure indicator light		1.4	←
Brake-lock indicator light		1.4	←
High beam indicator light		1.4	←
Turn signal indicator light		1.4 × 2	←
Power mode indicator light		1.4	←
Drive indicator light		1.4	←
Gear position indicator light		1.4 × 5	←
Trunk light		5	←
* Immobilizer indicator light		LED	
* Over drive indicator light		1.4	←

BRAKE + WHEEL

Unit: mm (in)

ITEM	STANDARD		LIMIT
Brake disc thickness	Front	4.5 ± 0.2 (0.177 ± 0.008)	4.0 (0.16)
	Rear	5.5 ± 0.2 (0.217 ± 0.008)	5.0 (0.20)
Brake disc runout	—		0.30 (0.012)
Master cylinder bore	Front	12.700 – 12.743 (0.5000 – 0.5017)	—
	Rear	12.700 – 12.743 (0.5000 – 0.5017)	—
Master cylinder piston diameter	Front	12.657 – 12.684 (0.4983 – 0.4994)	—
	Rear	12.657 – 12.684 (0.4983 – 0.4994)	—
Brake caliper cylinder bore	Front	25.400 – 25.450 (1.0000 – 1.0020)	—
	Rear	27.000 – 27.050 (1.0630 – 1.0650)	—
Brake caliper piston diameter	Front	25.318 – 25.368 (0.9968 – 0.9987)	—
	Rear	26.918 – 26.968 (1.0598 – 1.0617)	—
Brake fluid type	DOT 4		—

SAMPLE

ITEM	STANDARD		LIMIT
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout	Front	—	0.25 (0.010)
	Rear	—	0.25 (0.010)
Wheel rim size	Front	15 M/C × MT3.50	—
	Rear	14 M/C × MT4.50	—

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT
Front fork stroke	110 (4.3)	—
Front fork spring free length	—	341 (13.4)
Front fork oil type	SUZUKI FORK OIL G-10 (#10) or an equivalent fork oil	—
Front fork oil capacity (each leg)	458 ml	—
Front fork oil level	151 (5.9)	—
Front fork inner tube diam.	41 (1.61)	
Rear wheel travel	100 (3.9)	—
Rear shock absorber spring adjuster	2nd	—

SAMPLE

TIRE

ITEM		STANDARD		LIMIT
Cold inflation tire pressure	Solo riding	Front	225 kPa (2.25 kgf/cm^2, 33 psi)	—
		Rear	250 kPa (2.50 kgf/cm^2, 36 psi)	—
	Dual riding	Front	225 kPa (2.25 kgf/cm^2, 33 psi)	—
		Rear	280 kPa (2.80 kgf/cm^2, 41 psi)	—
Tire size		Front	120/70R15M/C 56H	—
		Rear	160/60R14M/C 65H	—
Tire type		Front	BRIDGESTONE TH01F	—
		Rear	BRIDGESTONE TH01R	—
Tire tread depth (Recommended depth)		Front	—	1.6 mm (0.06 in)
		Rear	—	2.0 mm (0.08 in)

FUEL + OIL

ITEM	SPECIFICATION		NOTE
Fuel type	Use only unleaded gasoline of at least 87 pump octane (R/2 + M/2) or 91 octane or higher rated by the research method. Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.		E-03, 28, 33
	Gasoline used should be graded 91 octane or higher. An unleaded gasoline is recommended.		The others
Fuel tank capacity	Including reserve	15.0 L (4.0/3.3 US/Imp gal)	
	Fuel meter mark flickering	Approx. 3.0 L (0.79/0.66 US/Imp gal)	
	Fuel meter mark and LCD flickering	Approx. 1.5 L (0.40/0.33 US/Imp gal)	
Engine oil and transmission oil type	* SAE 10W-40, API, SF/SG or SJ/SH with JASO MA		
Engine oil capacity	Oil change	2.6 L (2.7/2.3 US/Imp qt)	
	Filter change	2.9 L (3.1/2.6 US/Imp qt)	
	Overhaul	3.4 L (3.6/3.0 US/Imp qt)	
Transmission oil capacity	Oil change	360 ml (12.2/12.7 US/Imp oz)	
	Overhaul	400 ml (13.5/14.1 US/Imp oz)	
Final gear oil type	Hypoid gear oil SAE #90 API grade GL-5		
Final gear oil capacity	Oil change	300 ml (10.1/10.6 US/Imp oz)	
	Overhaul	430 ml (14.5/15.1 US/Imp oz)	

SAMPLE

SERVICE DATA (AN650AK5)

VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	29.5 (1.16)	—
	EX.	25.0 (0.98)	—
Tappet clearance (when cold)	IN.	0.10 – 0.20 (0.0039 – 0.0079)	—
	EX.	0.20 – 0.30 (0.0079 – 0.0118)	—
Valve guide to valve stem clearance	IN.	0.010 – 0.040 (0.0004 – 0.0016)	—
	EX.	0.030 – 0.060 (0.0012 – 0.0024)	—
Valve guide I.D.	IN. & EX.	4.500 – 4.515 (0.1772 – 0.1778)	—
Valve stem O.D.	IN.	4.475 – 4.490 (0.1762 – 0.1768)	—
	EX.	4.455 – 4.470 (0.1754 – 0.1760)	—
Valve stem deflection	IN. & EX.	—	0.35 (0.014)
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve head thickness	IN. & EX.	—	0.5 (0.02)
Valve seat width	IN. & EX.	0.9 – 1.1 (0.035 – 0.043)	—
Valve head radial runout	IN. & EX.	—	0.03 (0.001)
Valve spring free length (IN. & EX.)	IN. & EX.	—	40.6 (1.60)
Valve spring tension (IN. & EX.)	IN. & EX.	136 – 156 N (13.6 – 15.6 kgf, 30.0 – 34.4 lbs) at length 33.4 mm (1.31 in)	—

SIMPLE

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM	STANDARD		LIMIT
Cam height	IN.	35.38 – 35.43 (1.393 – 1.395)	35.10 (1.382)
	EX.	33.98 – 34.03 (1.338 – 1.340)	33.70 (1.327)
Camshaft journal oil clearance	IN. & EX.	0.032– 0.066 (0.0013 – 0.0026)	0.150 (0.0059)
Camshaft journal holder I.D.	IN. & EX.	24.012 – 24.025 (0.9454 – 0.9459)	—
Camshaft journal O.D.	IN. & EX.	23.959 – 23.980 (0.9433 – 0.9441)	—
Camshaft runout	IN. & EX.	—	0.10 (0.004)
Cam chain pin (at arrow "3")	15th pin		—
Cylinder head distortion	—		0.10 (0.004)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure	1 500 – 1 900 kPa (15.0 – 19.0 kgf/cm², 213 – 270 psi)			1 200 kPa (12 kgf/cm², 171 psi)
Compression pressure difference	—			200 kPa (2.0 kgf/cm², 28 psi)
Piston to cylinder clearance	0.045 – 0.055 (0.0018 – 0.0022)			0.120 (0.0047)
Cylinder bore	75.500 – 75.515 (2.9724 – 2.9730)			Nicks or scratches
Piston diam.	* 75.470 – 75.485 (2.9705 – 2.9711) Measure at 15 mm (0.6 in) from the skirt end.			75.380 (2.9677)
Cylinder distortion	—			0.10 (0.004)
Piston ring free end gap	1st	R	Approx. 11.6 (0.46)	9.3 (0.37)
	2nd	RN	Approx. 8.6 (0.34)	6.9 (0.27)
Piston ring end gap	1st		* 0.06 – 0.18 (0.002 – 0.005)	0.50 (0.020)
	2nd		* 0.06 – 0.18 (0.002 – 0.005)	0.50 (0.020)
Piston ring to groove clearance	1st		—	0.180 (0.007)
	2nd		—	0.150 (0.006)
Piston ring groove width	1st		1.01 – 1.03 (0.040 – 0.041)	—
	2nd		1.01 – 1.03 (0.040 – 0.041)	—
	Oil		2.01 – 2.03 (0.079 – 0.080)	—

SAMPLE

ITEM	STANDARD		LIMIT
Piston ring thickness	1st	0.97 – 0.99 (0.038 – 0.039)	—
	2nd	0.97 – 0.99 (0.038 – 0.039)	—
Piston pin bore	16.002 – 16.008 (0.6300 – 0.6302)		16.030 (0.6311)
Piston pin O.D.	15.995 – 16.000 (0.6297 – 0.6299)		15.980 (0.6291)

CONROD + CRANKSHAFT

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	16.010 – 16.018 (0.6303 – 0.6306)	16.040 (0.6315)
Conrod big end side clearance	0.10 – 0.20 (0.004 – 0.008)	0.30 (0.012)
Conrod big end width	19.950 – 20.000 (0.7854 – 0.7874)	—
Crank pin width	20.100 – 20.150 (0.7913 – 0.7933)	—
Conrod big end oil clearance	0.032 – 0.056 (0.0013 – 0.0022)	0.080 (0.0031)
Crank pin O.D.	44.976 – 45.000 (1.7707 – 1.7717)	—
Crankshaft journal oil clearance	0.018 – 0.045 (0.0007 – 0.0018)	0.080 (0.0031)
Crankshaft journal O.D.	47.985 – 48.000 (1.8892 – 1.8898)	—
Crankshaft thrust bearing thickness	2.025 – 2.175 (0.0797 – 0.0856)	—
Crankshaft thrust clearance	0.10 – 0.15 (0.0039 – 0.0059)	—
Crankshaft runout	—	0.05 (0.002)

SAMPLE

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pressure (at 60 °C, 140 °F)	Above 350 kPa (3.5 kgf/cm^2, 49.8 psi) Below 550 kPa (5.5 kgf/cm^2, 78.2 psi) at 3 000 r/min	—

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Drive plate thickness	2.92 – 3.08 (0.115 – 0.121)	2.62 (0.103)
Drive plate claw width	13.85 – 13.96 (0.545 – 0.550)	13.05 (0.514)
Driven plate No. 2 thickness	2.42 – 2.58 (0.095 – 0.102)	2.27 (0.089)
Driven plate distortion	—	0.10 (0.004)
Clutch spring free length	13.9 (0.547)	13.2 (0.520)
Clutch plate concaved washer height	3.2 (0.126)	3.1 (0.12)
Clutch engagement	1 500 – 2 100 r/min	—
Clutch lock-up	3 200 – 3 800 r/min	—

INJECTOR + FUEL PUMP + FUEL PRESSURE REGULATOR

ITEM	SPECIFICATION	NOTE
Injector resistance	11 – 13 Ω at 20 °C (68 °F)	—
Fuel pump discharge amount	More than 0.9 L (0.95/0.79 US/Imp qt) For 30 sec. at 300 kPa (3.0 kgf/cm², 43 psi)	—
Fuel pressure regulator operating set pressure	Approx. 300 kPa (3.0 kgf/cm², 43 psi)	—

FI/CVT-SENSORS

ITEM	SPECIFICATION		NOTE
CMP sensor resistance	0.9 – 1.7 kΩ		
CMP sensor peak voltage	More than 0.5 V (When cranking)		⊕: B/Y, ⊖: Br
CKP sensor resistance	150 – 300 Ω		
CKP sensor peak voltage	More than 2.0 V (When cranking)		⊕: Bl, ⊖: G
IAP sensor input voltage	4.5 – 5.5 V		
IAP sensor output voltage	Approx. 2.6 V at idle speed		
TP sensor input voltage	4.5 – 5.5 V		
TP sensor resistance	Closed	Approx. 1.1 kΩ	
	Opened	Approx. 4.2 kΩ	
TP sensor output voltage	Closed	Approx. 1.1 V	
	Opened	Approx. 4.3 V	
ECT sensor input voltage	4.5 – 5.5 V		
ECT sensor resistance	Approx. 2.45 kΩ at 20 °C (68 °F)		
IAT sensor input voltage	4.5 – 5.5 V		
IAT sensor resistance	Approx. 2.45 kΩ at 20 °C (68 °F)		
AP sensor input voltage	4.5 – 5.5 V		
AP sensor output voltage	Approx. 3.6 V at 100 kPa (760 mmHg)		
TO sensor resistance	19.1 – 19.7 kΩ		
TO sensor output voltage	Normal	0.4 – 1.4 V	⊕: B, ⊖: B/Br
	Leaning	3.7 – 4.4 V	⊕: B, ⊖: B/Br
Injector voltage	Battery voltage		

SAMPLE

ITEM	SPECIFICATION		NOTE
Ignition coil primary peak voltage	More than 80 V (When cranking)		#1 ⊕: W/Bl, ⊖: Ground #2 ⊕: B/Y, ⊖: Ground
HO2 sensor resistance	4 – 5 Ω at 23 °C (73.4 °F)		
HO2 sensor output voltage	Idle speed	Less than 0.4 V	
	3 000 r/min	More than 0.6 V	
PAIR solenoid valve resistance	20 – 24 Ω at 20 °C (68 °F)		
CVT primary pulley position sensor	Compressed	1.9 – 2.3 kΩ	
	Extended	0.2 – 1.0 kΩ	
CVT primary pulley position sensor output voltage	1st: Idle speed	Approx. 3.3 V	
	3rd: 3 000 r/min	Approx. 1.3 V	
	5th: 3 000 r/min	Approx. 0.5 V	
CVT secondary pulley revolution sensor resistance	400 – 600 Ω		
CVT secondary pulley revolution sensor peak voltage	More than 5 V at idle speed		⊕: Y, ⊖: W

THROTTLE BODY

ITEM	SPECIFICATION
I.D. No.	10GO
Bore size	32 mm (1.26 in)
Fast idle r/min	1 300 – 1 600 r/min
Idle r/min	1 200 ± 100 r/min
Synchronizing screw opening	1 and 1/2 turns out
IAC valve resistance	Approx. 4 Ω at 20 – 24 °C (68 – 75 °F)
Throttle cable play	2.0 – 4.0 mm (0.08 – 0.16 in)

SAMPLE

THERMOSTAT + RADIATOR + FAN + COOLANT

ITEM	STANDARD/SPECIFICATION		LIMIT
Thermostat valve opening temperature	Approx. 88 °C (190 °F)		—
Thermostat valve lift	Over 8.0 mm (0.3 in) at 100 °C (212 °F)		—
Engine coolant temperature sensor resistance	20 °C (68 °F)	Approx. 2.45 kΩ	—
	50 °C (122 °F)	Approx. 0.811 kΩ	—
	80 °C (176 °F)	Approx. 0.318 kΩ	—
	110 °C (230 °F)	Approx. 0.142 kΩ	—
Radiator cap valve opening pressure	110 kPa (1.1 kgf/cm²)		—
Eclectic fan thermo-switch operating temperature	ON	93 – 103 °C (199 – 217 °F)	—
	OFF	87 – 97 °C (188 – 206 °F)	—
Engine coolant type	Use an anti-freeze/coolant compatible with aluminum radiator, mixed with distilled water only, at the ratio of 50:50.		—

ITEM	STANDARD/SPECIFICATION		LIMIT
Engine coolant including reserve	Reverse tank side	Approx. 250 ml (0.264/0.220 US/Imp qt)	—
	Engine side	Approx. 1 350 ml (1.427/1.188 US/Imp qt)	—

ELECTRICAL

Unit: mm (in)

ITEM	STD/SPEC.		NOTE
Firing order	1·2		
Spark plug	Type	NGK: CR8E DENSO: U24ESR-N	
	Gap	0.7 – 0.8 (0.028 – 0.031)	
Spark performance	Over 8.0 (0.3) at 1 atm.		
CKP sensor peak voltage	More than 2.0 V		⊕: Bl, ⊖:G
Ignition coil resistance	Primary	0.8 – 2.5 Ω	
	Secondary	8 – 18 kΩ	
Ignition coil primary peak voltage	More than 80 V		#1 ⊕: W/Bl, ⊖: Ground #2 ⊕: B/Y, ⊖: Ground
Generator coil resistance	CKP sensor	150 – 300 Ω	G – Bl
	Charging	0.1 – 1.0 Ω	Y – Y
Generator no-load voltage (When cold)	More than 50 V at 5 000 r/min		
Generator Max. output	Approx. 500 W at 5 000 r/min		
Regulated voltage	14.0 – 15.5 V at 5 000 r/min		
Starter relay resistance	3 – 6 Ω		
Battery	Type designation	FTX14-BS	
	Capacity	12 V 43.2 kC (12 Ah)/10 HR	
Fuse size	Head-light LO	15 A	
	Head-light HI	15 A	
	Fuel pump	10 A	
	Ignition	15 A	
	Turn signal	15 A	
	Fan motor	15 A	
	Main	40 A	
	CVT	40 A	
	Power source	10 A	
	ABS	15 A × 2	

SAMPLE

WATTAGE

Unit: W

ITEM		STD/SPEC.	
		E-02, 19	E-03, 24, 28, 33
Headlight	HI	60 + 55	60 × 2
	LO	55	55 × 2
Parking or position light		5 × 2	
Brake light/Taillight		21/5 × 2	←
Turn signal light		21 × 4	←
License light		5	←
Instrument panel light		1.4 × 2	←
Engine coolant temp. indicator light		1.4	←
FI indicator light		1.4	←
Engine oil pressure indicator light		1.4	←
Brake-lock indicator light		1.4	←
High beam indicator light		1.4	←
Turn signal indicator light		1.4 × 2	←
Power mode indicator light		1.4	←
Drive indicator light		1.4	←
Gear position indicator light		1.4 × 5	←
ABS warning indicator light		1.4	
Trunk light		5	←
* Immobilizer indicator light		LED	
* Over drive indicator light		1.4	←

BRAKE + WHEEL

Unit: mm (in)

ITEM	STANDARD		LIMIT
Brake disc thickness	Front	4.5 ± 0.2 (0.177 ± 0.008)	4.0 (0.16)
	Rear	5.5 ± 0.2 (0.217 ± 0.008)	5.0 (0.20)
Brake disc runout	—		0.30 (0.012)
Master cylinder bore	Front	12.700 – 12.743 (0.5000 – 0.5017)	—
	Rear	12.700 – 12.743 (0.5000 – 0.5017)	—
Master cylinder piston diameter	Front	12.657 – 12.684 (0.4983 – 0.4994)	—
	Rear	12.657 – 12.684 (0.4983 – 0.4994)	—
Brake caliper cylinder bore	Front	25.400 – 25.450 (1.0000 – 1.0020)	—
	Rear	27.000 – 27.050 (1.0630 – 1.0650)	—
Brake caliper piston diameter	Front	25.318 – 25.368 (0.9968 – 0.9987)	—
	Rear	26.918 – 26.968 (1.0598 – 1.0617)	—
Brake fluid type	DOT 4		—

SAMPLE

ITEM	STANDARD		LIMIT
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout	Front	—	0.25 (0.010)
	Rear	—	0.25 (0.010)
Wheel rim size	Front	15 M/C × MT3.50	—
	Rear	14 M/C × MT4.50	—

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT
Front fork stroke	110 (4.3)	—
Front fork spring free length	—	341 (13.4)
Front fork oil type	SUZUKI FORK OIL G-10 (#10) or an equivalent fork oil	—
Front fork oil capacity (each leg)	458 ml	—
Front fork oil level	151 (5.9)	—
Front fork inner tube diam.	41 (1.61)	
Rear wheel travel	100 (3.9)	—
Rear shock absorber spring adjuster	2nd	—

SAMPLE

TIRE

ITEM		STANDARD		LIMIT
Cold inflation tire pressure	Solo riding	Front	225 kPa (2.25 kgf/cm^2, 33 psi)	—
		Rear	250 kPa (2.50 kgf/cm^2, 36 psi)	—
	Dual riding	Front	225 kPa (2.25 kgf/cm^2, 33 psi)	—
		Rear	280 kPa (2.80 kgf/cm^2, 41 psi)	—
Tire size		Front	120/70R15M/C 56H	—
		Rear	160/60R14M/C 65H	—
Tire type		Front	BRIDGESTONE TH01F	—
		Rear	BRIDGESTONE TH01R	—
Tire tread depth (Recommended depth)		Front	—	1.6 mm (0.06 in)
		Rear	—	2.0 mm (0.08 in)

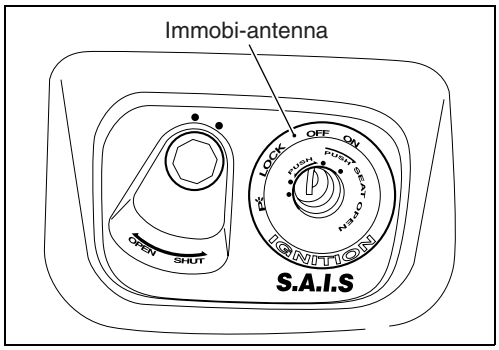
FUEL + OIL

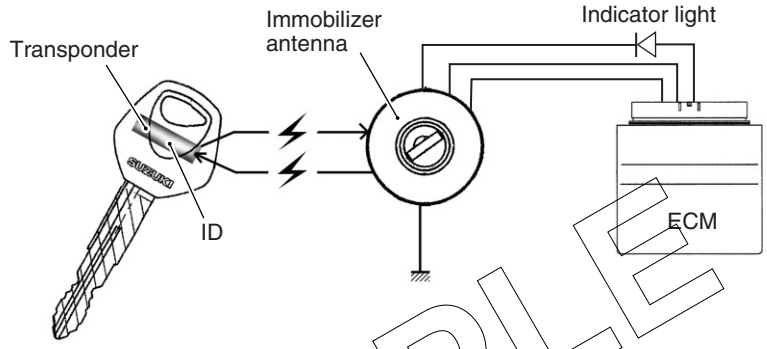
ITEM	SPECIFICATION		NOTE
Fuel type	Gasoline used should be graded 91 octane or higher. An unleaded gasoline is recommended.		
Fuel tank capacity	Including reserve	15.0 L (4.0/3.3 US/Imp gal)	
	Fuel meter mark flickering	Approx. 3.0 L (0.79/0.66 US/Imp gal)	
	Fuel meter mark and LCD flickering	Approx. 1.5 L (0.40/0.33 US/Imp gal)	
Engine oil and transmission oil type	* SAE 10W-40, API, SF/SG or SJ/SH with JASO MA		
Engine oil capacity	Oil change	2.6 L (2.7/2.3 US/Imp qt)	
	Filter change	2.9 L (3.1/2.6 US/Imp qt)	
	Overhaul	3.4 L (3.6/3.0 US/Imp qt)	
Transmission oil capacity	Oil change	360 ml (12.2/12.7 US/Imp oz)	
	Overhaul	400 ml (13.5/14.1 US/Imp oz)	
Final gear oil type	Hypoid gear oil SAE #90 API grade GL-5		
Final gear oil capacity	Oil change	300 ml (10.1/10.6 US/Imp oz)	
	Overhaul	430 ml (14.5/15.1 US/Imp oz)	

SAMPLE

IMMOBILIZER (E-02, 19, 000)

- The immobilizer, an anti-theft system, is installed as a standard equipment.
- The immobilizer verifies that the key ID agrees with ECM ID by means of radio communication through the immobilizer antenna. When the ID agreement is verified, the system makes the engine ready to start.
- This system is same as the AN250/400K5.





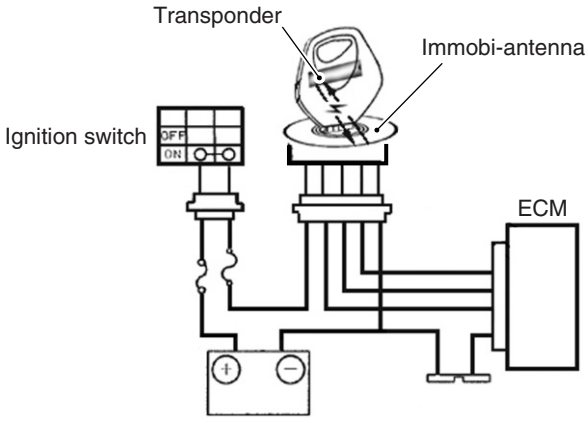
SAMPLE

OPERATION

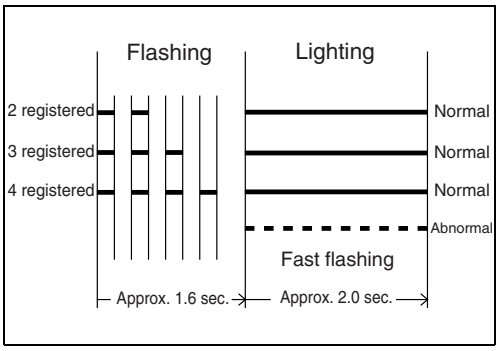
When the ignition switch is turned ON with the engine stop switch in ON and the side stand in up position, the immobi-antenna and ECM are powered ON.

The ECM transmits a signal to the transponder through the immobi-antenna in order to make comparison between the key ID and ECM ID.

With the signal received, the transponder transmits the key ID signal to ECM so that ECM can make comparison with its own ID, and if it matches, the engine is made ready to start.



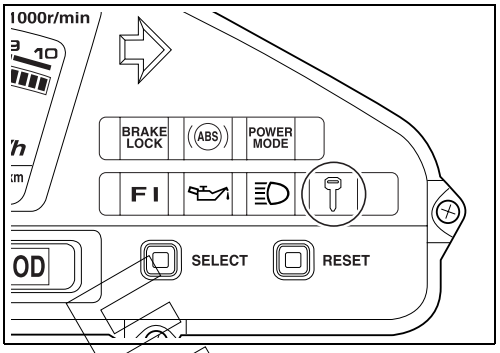
Also, when the ignition switch is turned ON, the indicator light flashes as many as the number of IDs registered in ECM. Thereafter, if the IDs are in agreement, the indicator light turns on for two seconds to notify of completion in successful communication.
If the indicator light flashes fast, it notifies of communication error or disagreement of ID.



NOTE:
If the indicator light flashes fast, turn the ignition switch OFF then ON to make judgment again as there is possible misjudgment due to environmental radio interference.

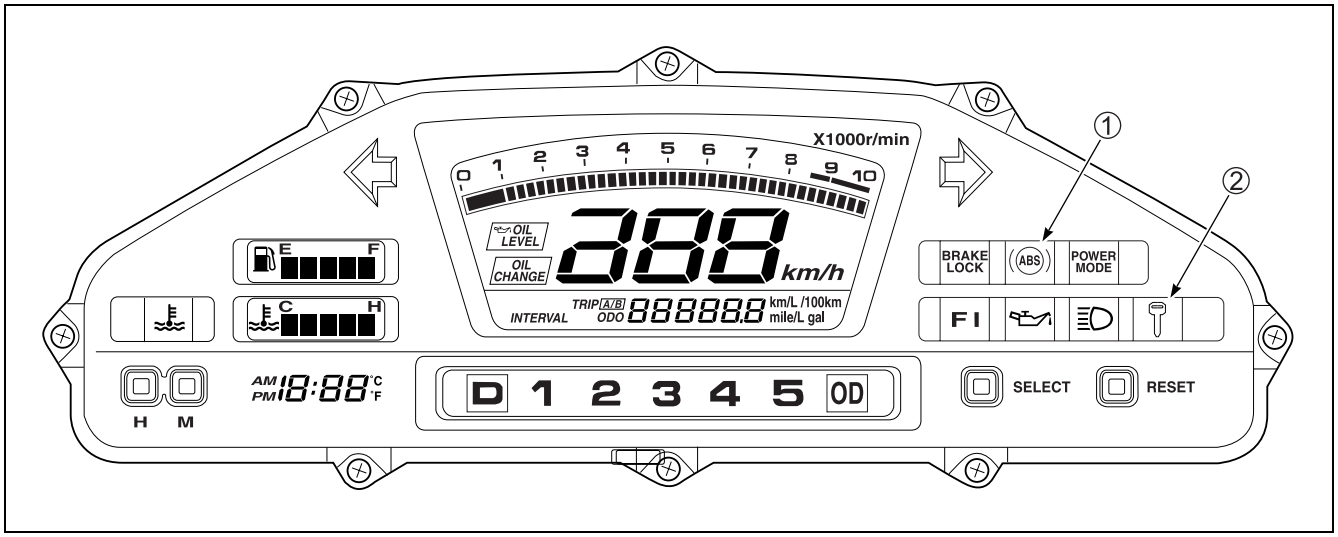
CAUTION

When the battery performance is lowered in winter (low temperature), the system may make a re-judgment at the time of beginning of the starter motor operation. In this case, the indicator light operation starts immediately after the starter motor operation.

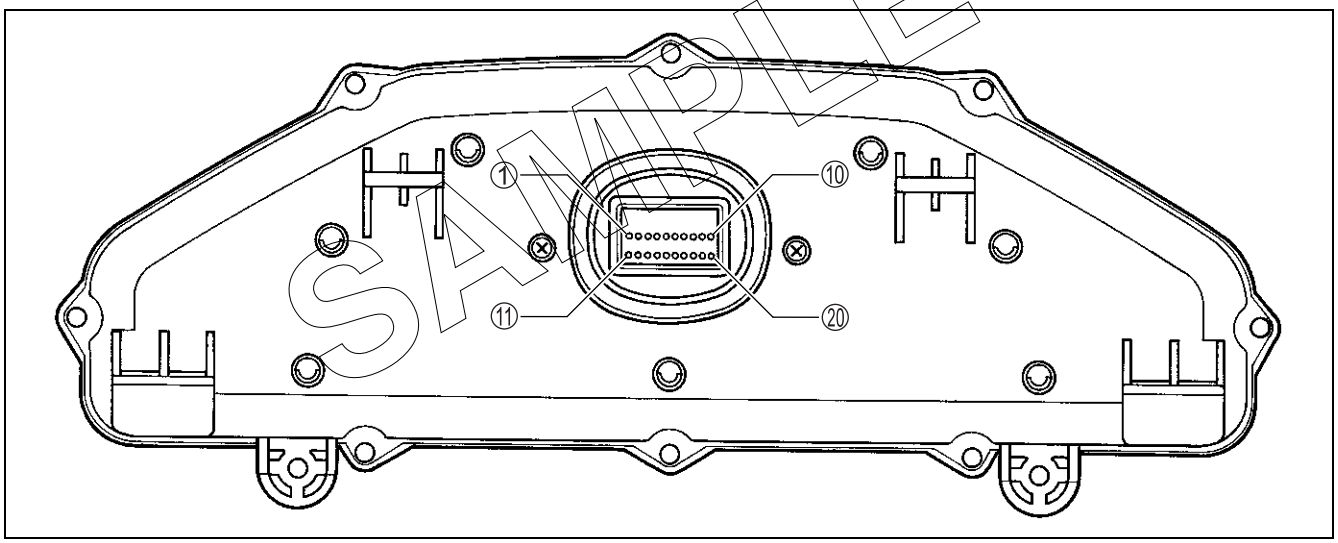


SAMPLE

COMBINATION METER



① AN650A only
② E-02, 19, 000 only



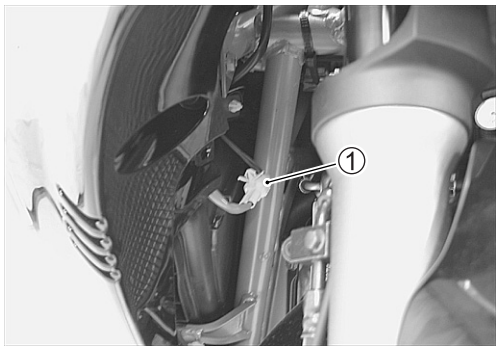
SAMPLE

TERMINAL ALIGNMENT

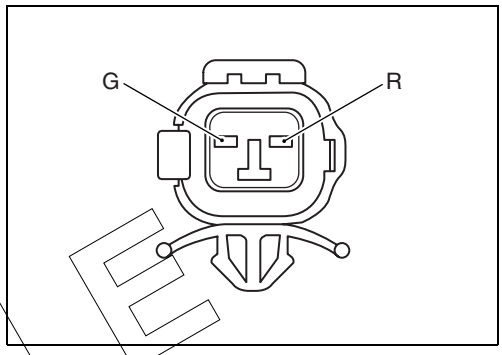
①	Oil pressure switch (G/Y)	⑪	Turn signal L (B)
②	—	⑫	Turn signal R (Lg)
③	Speed sensor (O/R)	⑬	Illumination ⊕ (O/G)
④	Ignition (O/G)	⑭	ABS (Br) [AN650A]
⑤	Battery (R/Bl)	⑮	Brake lock switch (V)
⑥	Speed sensor signal (W)	⑯	High beam (Y)
⑦	Tachometer signal (Br/W)	⑰	Immobilizer (E-02, 19, 000)
⑧	Oil level switch (Bl)	⑱	Ambient air temperature sensor (Bl)
⑨	FI (P/W)	⑲	Fuel pump (R/B)
⑩	Signal ground (B/W)	⑳	Power ground (B/W)

POWER WIND SCREEN (AN650AK5 E-02, 19, 000)

INSPECTION



- Remove the lower leg shield. (☞AN650K3 9-10)
- Disconnect the wind screen regulator coupler ①.

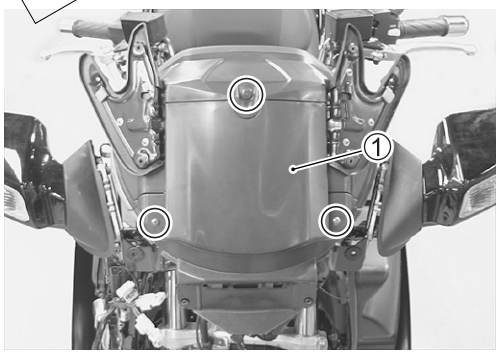


- Apply 12 V voltage to the terminals of the regulator coupler and check that the wind screen moves in the correct direction.

Terminal – Terminal	Window screen
R ⊕ – ⊖ G	UP
G ⊕ – ⊖ R	DOWN

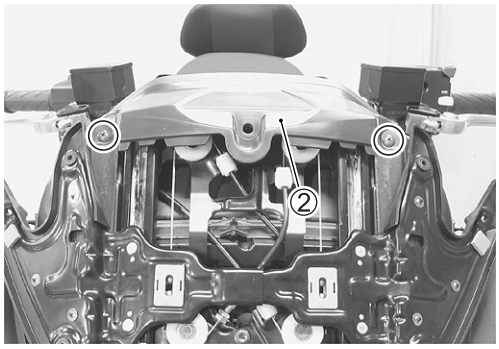
- Repeat above inspection several times and replace the window screen regulator assembly if necessary.

REMOVAL



- Remove the wind screen. (☞Page 42)
- Remove the leg shield. (☞AN650K3 9-10)
- Remove the meter front lower panel ①.

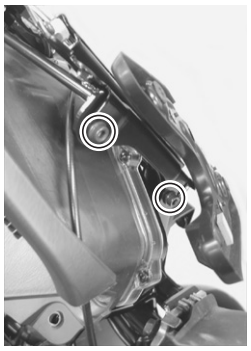
NOTE:
Remove the bolts/screws behind the regulator by moving the regulator up or down.

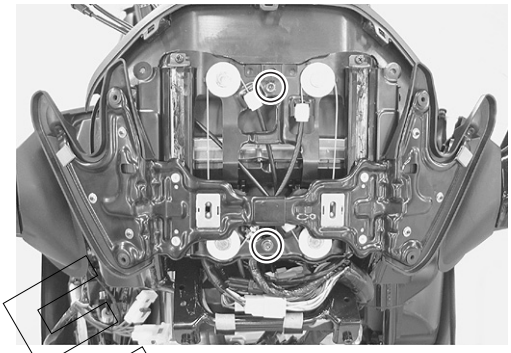


- Remove the meter front upper panel ②.

SAMPLE

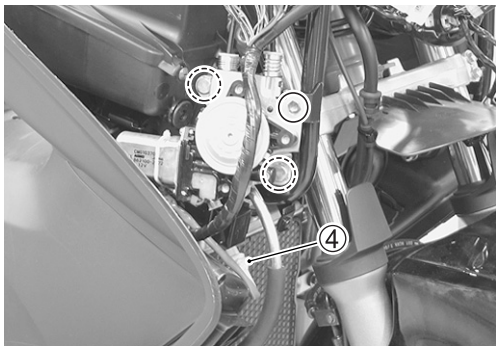
- Remove the regulator mounting bolts.





- Disconnect the couplers.

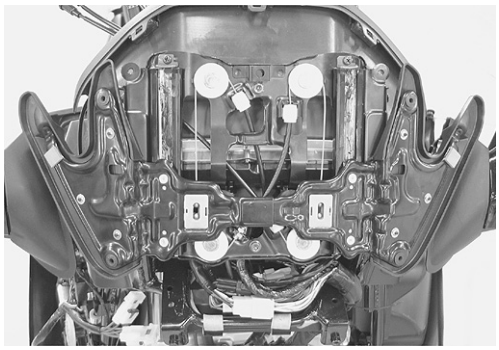
- Disconnect the regulator coupler ④.
- Remove the regulator motor mounting bolt and nuts.
- Remove the wind screen regulator assembly.



INSTALLATION

Installation is in the reverse order of removal. Pay attention to the following point:

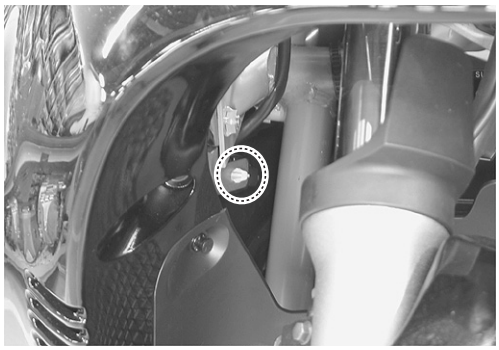
- Rout the cables properly. (☞Page 40)
- Apply grease to the wires, pulleys and guide rails.



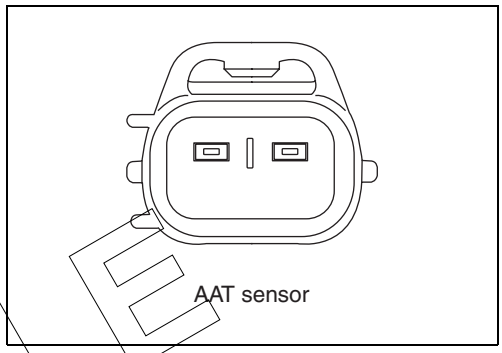
SAMPLE

AMBIENT AIR TEMPERATURE SENSOR

INSPECTION



- Turn the ignition switch to OFF.
- Remove the AAT (Ambient Air Temperature) sensor by pushing off the clamp.



- Check the AAT sensor coupler for loose or poor contacts. If OK, measure the AAT sensor resistance.

DATA AAT sensor resistance:
Approx. 2.12 kΩ at 20 °C (68 °F)
(Terminal – Terminal)

TOOL 09900-25008: Multi-circuit tester set

Tester knob indication: Resistance (Ω)

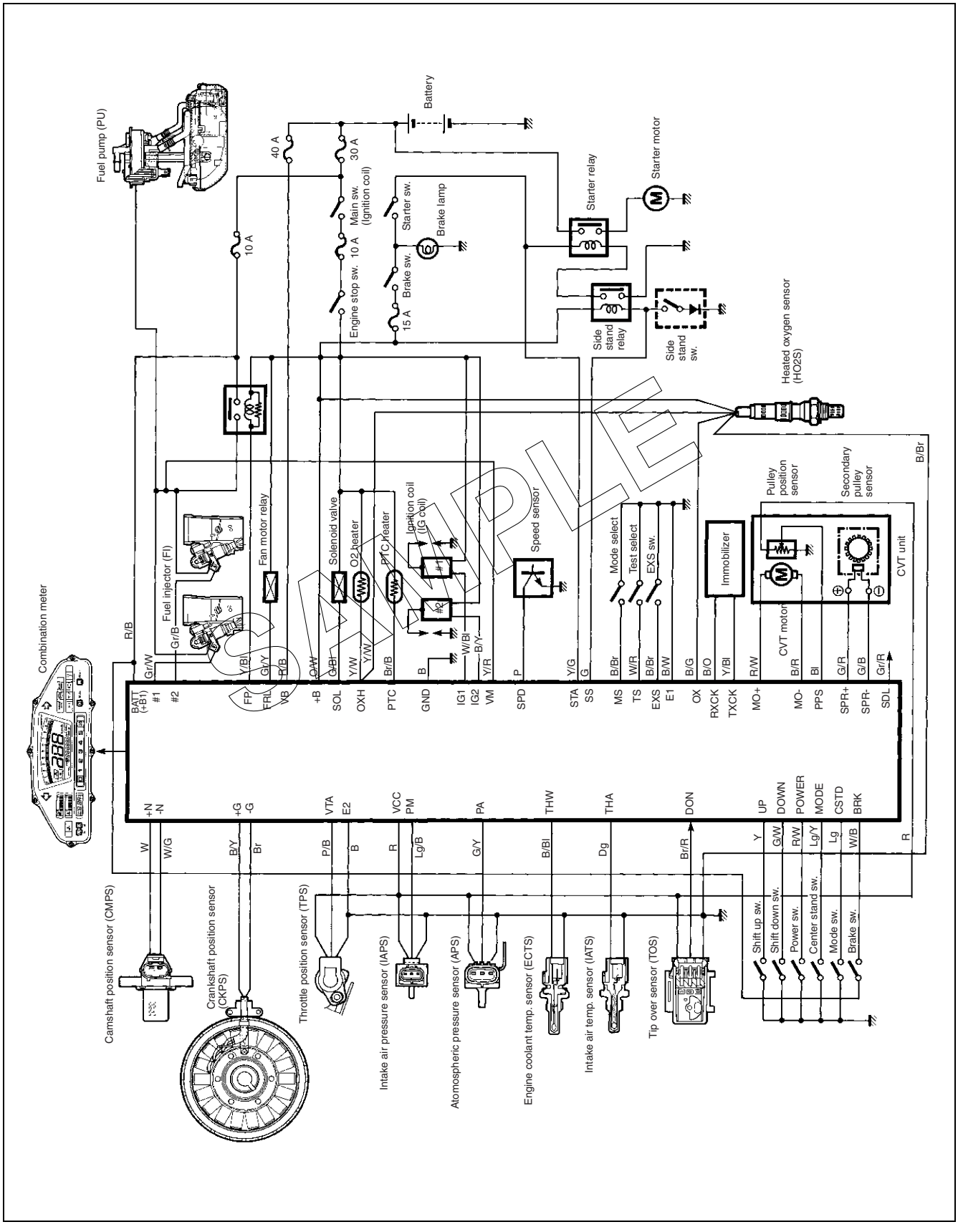
Intake Air Temp	Resistance
20 °C (68 °F)	Approx. 2.1 kΩ
25 °C (77 °F)	Approx. 1.7 kΩ
30 °C (86 °F)	Approx. 1.4 kΩ
40 °C (104 °F)	Approx. 0.9 kΩ

NOTE:
AAT sensor resistance measurement method is the same way as that of the ECT sensor. Refer to AN650K3 8-13 for details.

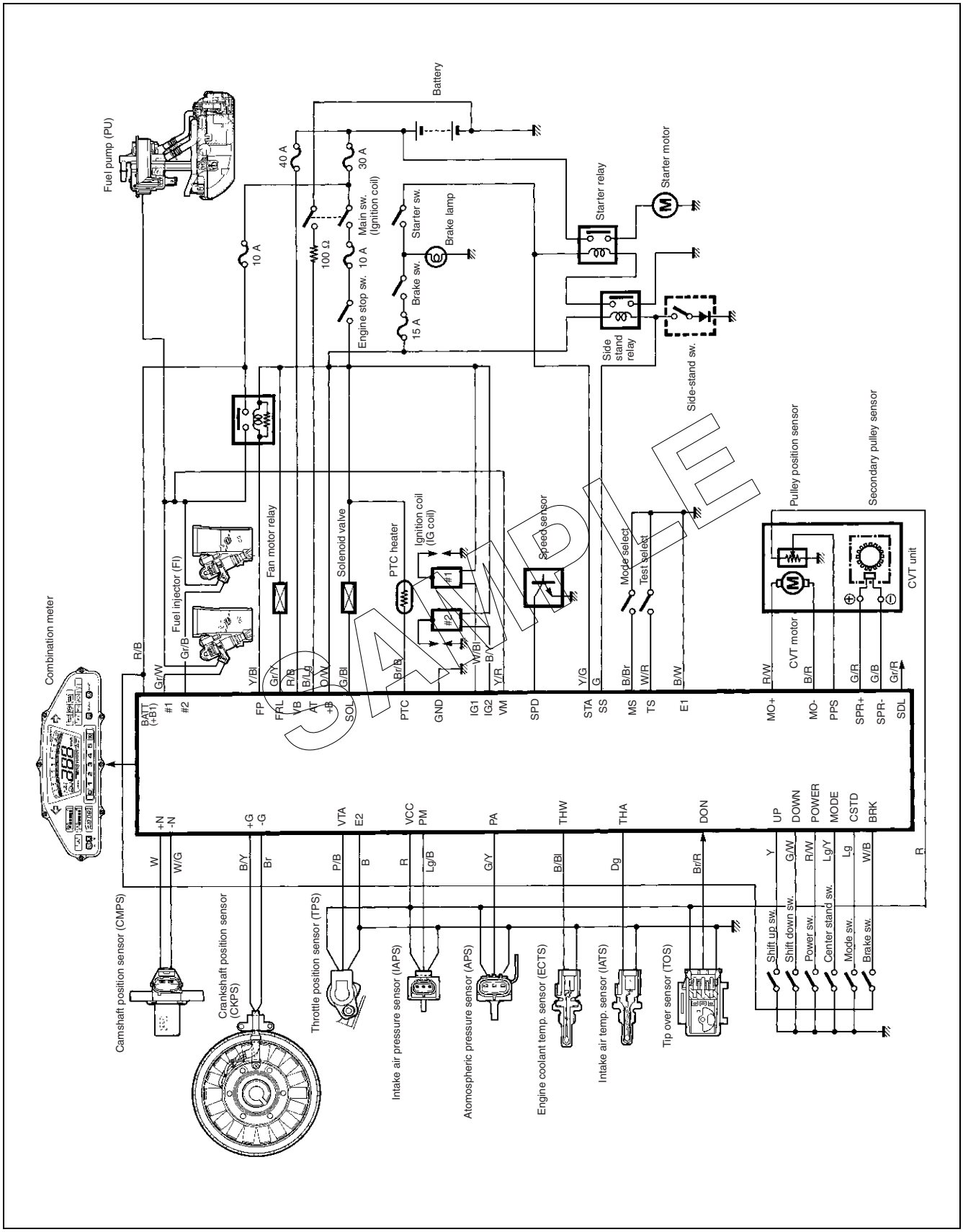
- If neccesary, replace the AAT sensor with a new one.

SAMPLE

FI SYSTEM WIRING DIAGRAM
E-02, 19, 000

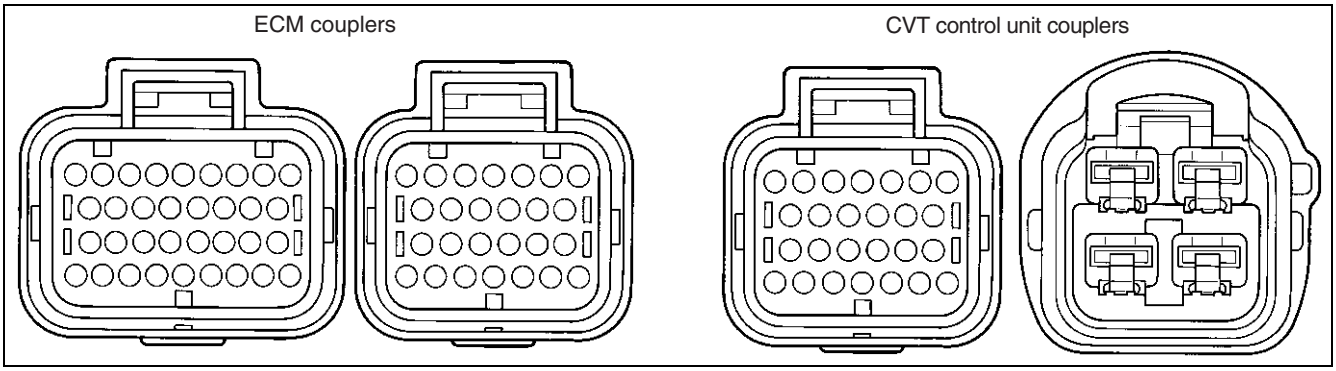


E-03, 28, 33

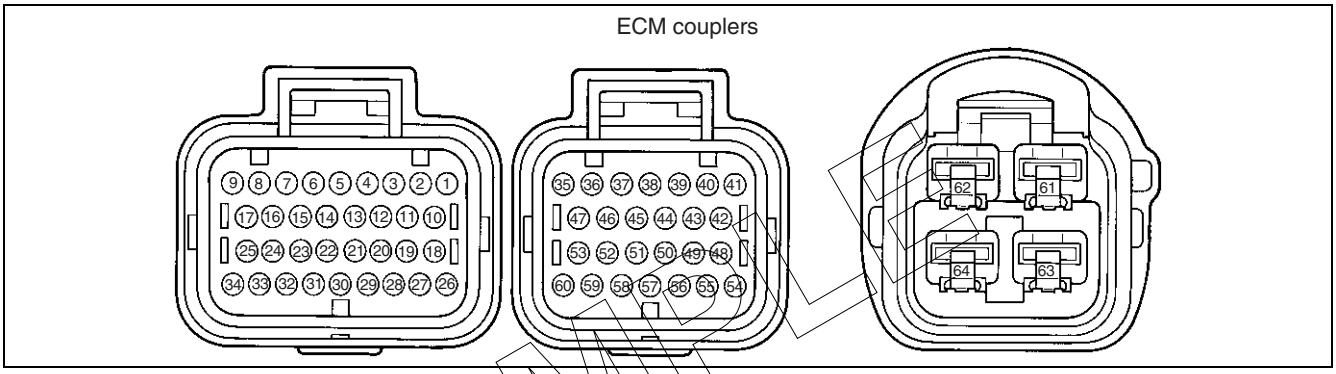

Battery
Fuel pump (PU)
40 A
30 A
10 A
100 Ω
Main sw. (Ignition coil)
Starter sw.
Brake lamp
Starter relay
Starter motor
Engine stop sw.
10 A
Brake sw.
15 A
Side stand relay
Side-stand sw.
Combination meter
Fuel injector (FI)
Fan motor relay
Solenoid valve
PTC heater
Ignition coil (IG coil)
Speed sensor
Mode select
Test select
Pulley position sensor
Secondary pulley sensor
CVT unit
CVT motor
BATT (+B1)
#1
#2
FP
FRL
VB
AT
+B
SOL
PTC
GND
IG1
IG2
VM
SPD
STA
SS
MS
TS
E1
MO+
MO-
PPS
SPR+
SPR-
SDL
+N
-N
+G
-G
VTA
E2
VCC
PM
PA
THW
THA
DON
UP
DOWN
POWER
MODE
CSTD
BRK
Camshaft position sensor (CMPS)
Crankshaft position sensor (CKPS)
Throttle position sensor (TPS)
Intake air pressure sensor (IAPS)
Atomospheric pressure sensor (APS)
Engine coolant temp. sensor (ECTS)
Intake air temp. sensor (IATS)
Tip over sensor (TOS)
Shift up sw.
Shift down sw.
Power sw.
Center stand sw.
Mode sw.
Brake sw.
R/B
Gr/W
Gr/B
Y/Bl
Gr/Y
R/B
B/Lg
O/W
G/Bl
Br/B
W/Bl
B/Y
V/R
Y/G
G
B/Br
W/R
B/W
R/W
B/R
G/R
G/B
Gr/R
W
W/G
B/Y
Br
P/B
B
R
Lg/B
G/Y
B/Bl
Dg
Br/R
Y
G/W
R/W
Lg/Y
Lg
W/B
R
SAMPLE

ECM COUPLERS

K4 MODEL ECM AND CVT CONTROL UNIT COUPLERS



K5 MODEL ECM COUPLERS



SAMPLE

ECM TERMINAL NO.	CIRCUIT	ECM TERMINAL NO.	CIRCUIT
①	Ignition coil (IG1)	⑰	Battery (+B)
②	Fuel injector (#1)	⑱	Center stand switch (CSTD)
③	Fuel injector (#2)	⑲	Side stand switch (SS)
④	Shift up switch (UP)	⑳	Brake switch (BRK)
⑤	Pulley position sensor (PPS)	㉑	Mode select switch (MS)
⑥	PTC heater (PTC)	㉒	Test switch (TS)
⑦	Speedometer (SPD)	㉓	CO and injection pulse width adjust box (COV1)
⑧	Solenoid valve (SOL)	㉔	CO and injection pulse width adjust box (COV2)
⑨	Fuel pump relay (FP)	㉕	CO and injection pulse width adjust box (COV3)
⑩	Ignition coil (IG2)	㉖	Ground (E03)
⑪	Fan motor relay (FRL)	㉗	Ground (E01)
⑫	Power switch (POWER)	㉘	Starter relay (STA)
⑬	Mode switch (MODE)	㉙	Writing tool (RXD1)
⑭	Shift down switch (DOWN)	㉚	Writing tool (TXD1)
⑮	CO and injection pulse width adjust box (COS1)	㉛	SDL-KWP (SDL)
⑯	CO and injection pulse width adjust box (COS2)	㉜	Writing tool (FWE)

ECM TERMINAL NO.	CIRCUIT	ECM TERMINAL NO.	CIRCUIT
㉝	Battery (BATT)	㊾	TP sensor (VTA)
㉞	Writing tool (RST)	㊿	IAT sensor (THA)
㉟	Ground (E1)	(51)	ECT sensor (THW)
㊱	CKP sensor (N-)	(52)	AP sensor (PA)
㊲	CMP sensor (G+)	(53)	O2 sensor control selector (EXS)
㊳	OX heater (OXH)	(54)	Ground (E2)
㊴	Immobilizer (TXCK)	(55)	Tachometer (TACO)
㊵	Immobilizer (RXCK)	(56)	Meter (TECH)
㊶	Immobilizer LED (LED)	(57)	Writing tool (SCK)
㊷	Injector power voltage (VM)	(58)	IAP sensor (PM)
㊸	CKP sensor (N+)	(59)	TO sensor (DON)
㊹	CMP sensor (G-)	(60)	Blank
㊺	O2 sensor (OX)	(61)	Battery (VB)
㊻	Secondary pulley sensor (SPR-)	(62)	Motor (MO+)
㊼	Secondary pulley sensor (SPR+)	(63)	Ground
㊽	Sensor power (VCC)	(64)	Motor (MO-)

SAMPLE

MALFUNCTION CODE

MALFUNCTION CODE	DETECTED ITEM	ECM COUPLER TERMINALS TO CHECK	
		K4	K5
C00	NO FAULT	————	————
C11	Camshaft position sensor	㊲, ㊹ (☞AN650K3 6-27)	←
C12	Crankshaft position sensor	㊱, ㊸ (☞AN650K3 6-28)	←
C13	Intake air pressure sensor	㊽, ㊿, ㊽ (☞AN650K3 6-30)	←
C14	Throttle position sensor	㊽, ㊾, ㊿ (☞AN650K3 6-32)	←
C15	Engine coolant temperature sensor	㊶, ㊿ (☞AN650K3 6-33)	←
C16	Speed sensor	————	————
C21	Intake air temperature sensor	㊿, ㊿ (☞AN650K3 6-36)	←
C22	Atmospheric pressure sensor	㊽, ㊷, ㊿ (☞AN650K3 6-38)	←
C23	Tip over sensor	㊽, ㊿, ㊾ (☞AN650K3 6-39)	←
C24 or C25	Ignition signal	④, ⑤, ㊷ (☞AN650K3 6-40)	←
C32 or C33	Fuel injector	④, ⑤, ㊷ (☞AN650K3 6-40)	②, ③, ㊷
C40	Intake air control (IAC) valve	————	————
C41	Fuel pump relay	⑨, ㊷ (☞AN650K3 6-41)	←
C42	Ignition switch	————	————
C44	Heated oxygen sensor (HO2S) [E-02, 19]	⑰, ㊳, ㊺, ㊿ (☞AN650K3 6-43)	←
C51	CVT motor	————	————
C52	CVT pulley position sensor	⑧, ⑭, ⑳ (CVT control unit coupler) (☞AN650K3 6-48)	⑤, ㉗, ㊽
C53	CVT speed sensor	————	————
C54	CVT secondary pulley revolution sensor	————	————
C55	CVT engine revolution signal	③ (CVT control unit coupler) ㊺ (ECM coupler) (☞AN650K3 6-53)	㊺
C58	CVT reduction ratio disagreement	————	————

SAMPLE

ABS TROUBLESHOOTING (AN650AK5)
MALFUNCTION CODE TROUBLESHOOTING
"41" Wheel speed sensor signal malfunction (F)

POSSIBLE CAUSE
• Poor contact on the front wheel speed sensor coupler
• Faulty front wheel speed sensor, etc.

1) Inspect the clearance between the front wheel speed sensor and sensor rotor using the thickness gauge.

DATA Wheel speed sensor – sensor rotor clearance:
0.3 – 1.5 mm

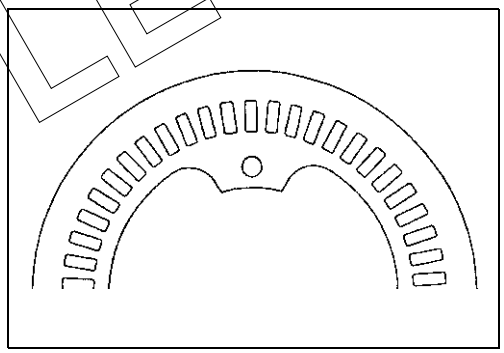
TOOL 09900-20803: Thickness gauge
09900-20806: Thickness gauge

Is the clearance OK?

YES	Go to step 2.
NO	Adjust the clearance.

2) Inspect the front wheel speed sensor rotor for damage and check that no foreign objects are caught in the rotor openings.

Is the sensor rotor OK?



YES	Go to step 3.
NO	Clean or replace the sensor rotor.

3) Check that the front wheel speed sensor is mounted steadily.

Is the sensor mounted steadily?

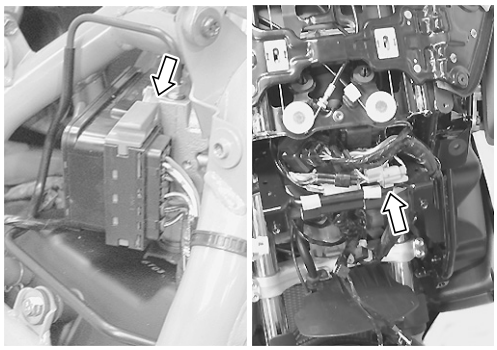
YES	Go to malfunction code "42". (☞Page 16).
NO	Tighten the mounting bolts or replace the bracket if necessary.

SAMPLE

"42" Wheel speed sensor circuit open (F)

POSSIBLE CAUSE
• Poor contact on the front wheel speed sensor coupler
• Faulty front wheel speed sensor, etc.

- Turn the ignition switch to OFF.
- Remove the leg shield. (☞AN650K3 9-10)
- Remove the meter front lower panel. (☞Page 8)
- Check the ABS control unit coupler and front wheel speed sensor coupler for looseness. If OK, disconnect the ABS control unit coupler.



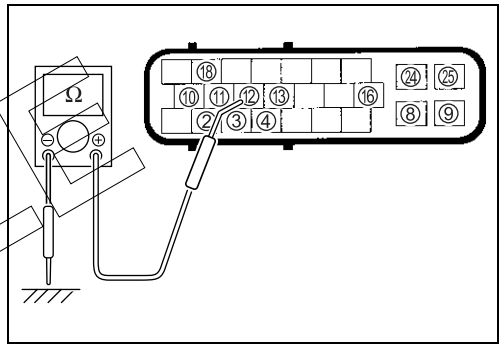
1) Measure the resistance between ⑫ (B/R) and ground at the ABS control unit coupler.

DATA Normal value: ∞

TOOL 09900-25008: Multi circuit tester set
09900-25009: Needle pointed probe set

Tester knob indication: Resistance (Ω)

Is the resistance between ⑫ and ground OK?



YES	Go to step 3.
NO	Go to step 2.

SAMPLE

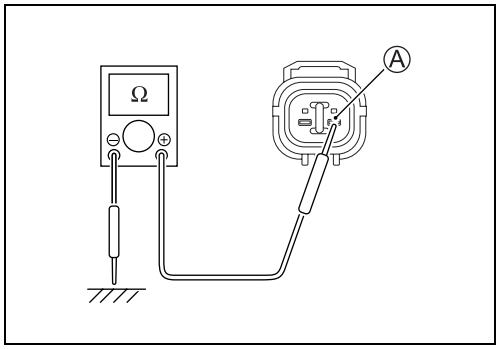
- Disconnect the front wheel speed sensor coupler.

2) Measure the resistance between Ⓐ (B) and ground at the front wheel speed sensor coupler.

DATA Normal value: ∞

Tester knob indication: Resistance (Ω)

Is the resistance between Ⓐ and ground OK?



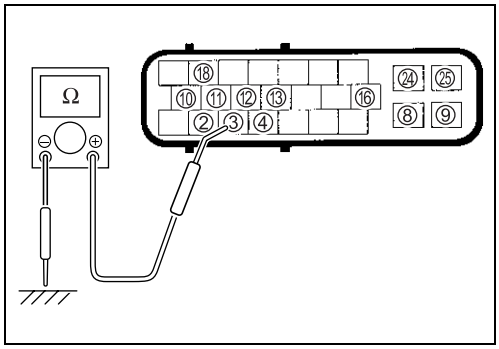
YES	Inspect the wire harness. (Faulty B/R wire)
NO	Faulty front wheel speed sensor

3) Measure the resistance between ③ (W/R) and ground at the ABS control unit coupler.

DATA Normal value: ∞

Tester knob indication: Resistance (Ω)

Is the resistance between ③ and ground OK?



YES	Go to step 5.
NO	Go to step 4.

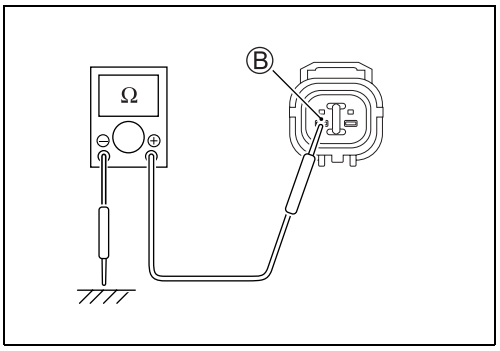
4) Measure the resistance between Ⓑ (W) and ground at the front wheel speed sensor coupler.

DATA Normal value: ∞

Tester knob indication: Resistance (Ω)

Is the resistance between Ⓑ and ground OK?

YES	Inspect the wire harness. (Faulty W/R wire)
NO	Faulty front wheel speed sensor

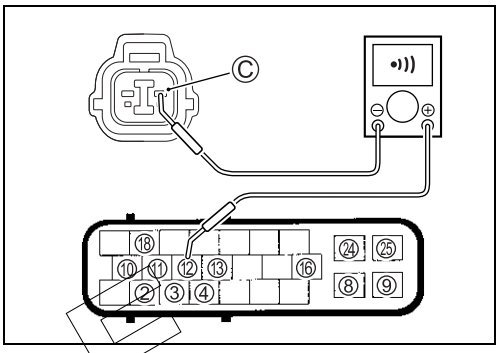


5) Check for continuity between ⑫ (B/R) on the ABS control unit coupler and Ⓒ (B/R) on the front wheel speed sensor coupler.

Tester knob indication: Continuity (•))))

Is there continuity between ⑫ and Ⓒ?

YES	Go to step 6.
NO	Inspect the wire harness. (Faulty B/R wire)

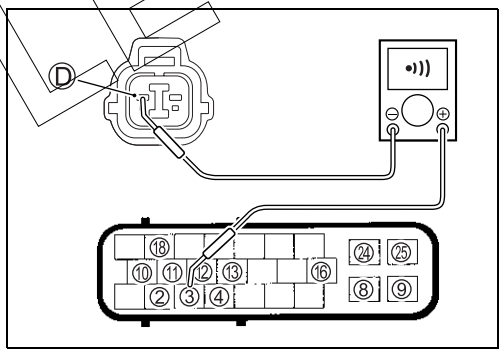


6) Check for continuity between ③ (W/R) on the ABS control unit coupler and Ⓓ (W/R) on the front wheel speed sensor coupler.

Tester knob indication: Continuity (•))))

Is there continuity between ③ and Ⓓ?

YES	Go to step 7.
NO	Inspect the wire harness. (Faulty W/R wire)



• Connect the front wheel speed sensor coupler.

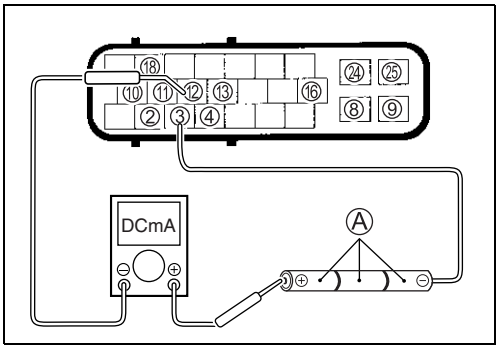
7) Connect three 1.5 V dry cells Ⓐ in series as shown and make sure that their total voltage is more than 4.5 V.
Measure the current between ⊕ dry cell terminal and ⑫ (B/R) on the ABS control unit coupler.

DATA Normal value: 3 – 14 mA

Tester knob indication: Current (⎓, 20 mA)

Is the current OK?

YES	Replace the ABS control unit/HU.
NO	Faulty front wheel speed sensor.



SAMPLE

"44" Wheel speed sensor signal malfunction (R)

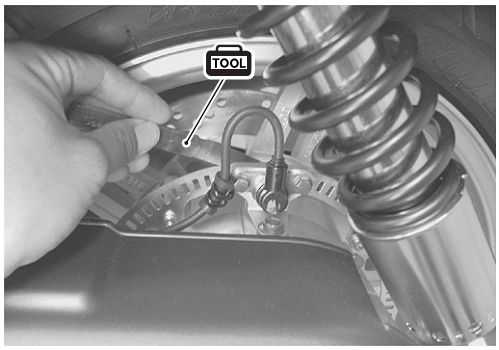
POSSIBLE CAUSE
• Poor contact on the rear wheel speed sensor coupler • Faulty rear wheel speed sensor, etc.

1) Inspect the clearance between the rear wheel speed sensor and sensor rotor using the thickness gauge.

DATA Wheel speed sensor – sensor rotor clearance:
0.3 – 1.5 mm

TOOL 09900-20803: Thickness gauge
09900-20806: Thickness gauge

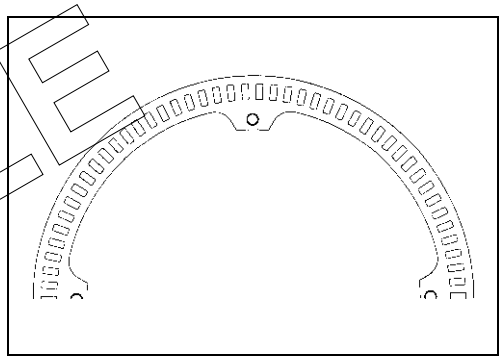
Is the clearance OK?



YES	Go to step 2.
NO	Adjust the clearance.

2) Inspect the rear wheel speed sensor rotor for damage and check that no foreign objects are caught in the rotor openings.

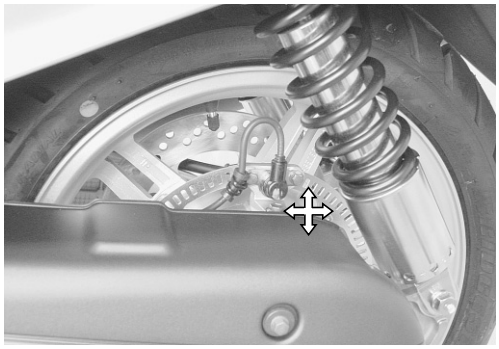
Is the sensor rotor OK?



YES	Go to step 3.
NO	Clean or replace the sensor rotor.

3) Check that the rear wheel speed sensor is mounted steadily.

Is the sensor mounted steadily?



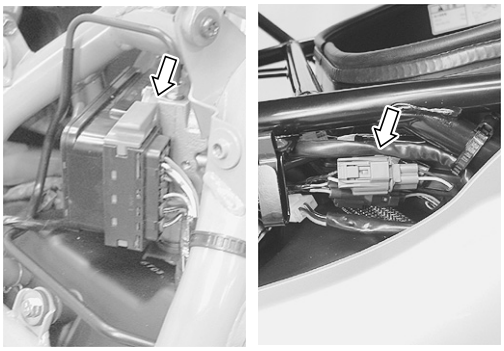
YES	Go to malfunction code "45". (☞Page 38)
NO	Tighten the mounting bolts or replace the bracket if necessary.

SAMPLE

"45" Wheel speed sensor circuit open (R)

POSSIBLE CAUSE
• Poor contact on the rear wheel speed sensor coupler • Faulty rear wheel speed sensor, etc.

- Turn the ignition switch to OFF.
- Remove the front box. (☞AN650K3 9-18)
- Remove the trunk box cover. (☞AN650K3 9-16)
- Check the ABS control unit/HU coupler and rear wheel speed sensor coupler for loose or poor contacts. If OK, then disconnect the ABS control unit/HU coupler



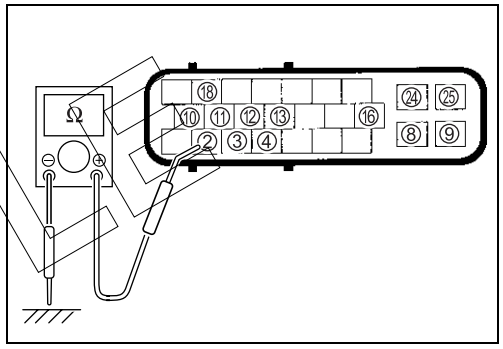
1) Check the resistance between terminal ② (B/Y) on the ABS control unit coupler and ground.

DATA Normal value: ∞ Ω (Infinity)

TOOL 09900-25008: Multi circuit tester set
09900-25009: Needle pointed probe set

Tester knob indication: Resistance (Ω)

Is the resistance OK?



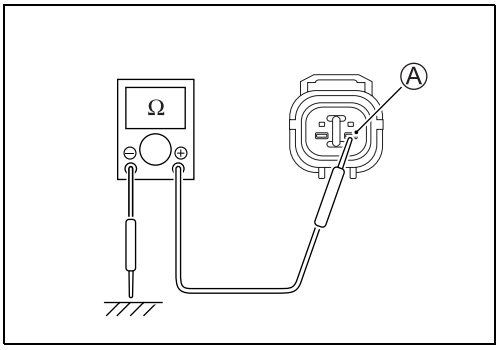
YES	Go to step 3.
NO	Go to step 2.

2) Check the resistance between Ⓐ (B) and ground.

DATA Normal value: ∞ Ω (Infinity)

Tester knob indication: Resistance (Ω)

Is the resistance OK?



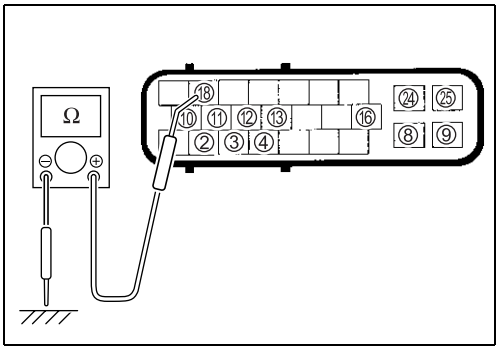
YES	Inspect the wire harness. (Faulty B/Y wire)
NO	Replace the rear wheel speed sensor.

3) Check the resistance between terminal ⑱ (W/Y) and ground.

DATA Normal value: ∞ Ω (Infinity)

Tester knob indication: Resistance (Ω)

Is the resistance OK?



YES	Go to step 5.
NO	Go to step 4.

SAMPLE

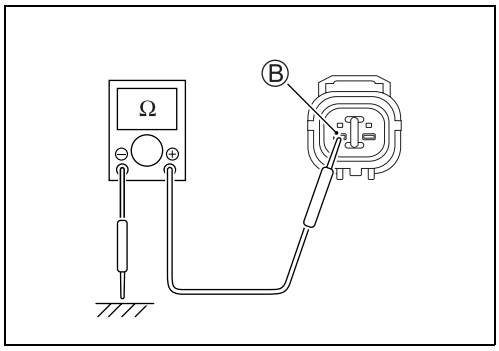
• Disconnect the rear wheel speed sensor coupler.

4) Check the resistance between Ⓑ (W) and ground.

DATA Normal value: ∞ Ω (Infinity)

Is the resistance OK?

YES	Inspect the wire harness. (Faulty W/Y wire)
NO	Replace the rear wheel speed sensor.



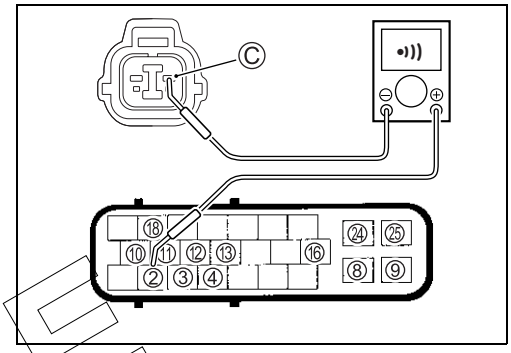
5) Check the continuity between Ⓒ (B/Y) and terminal ②.

DATA Normal value: Continuity (•)))

Tester knob indication: Continuity test (•)))

Is the continuity OK?

YES	Go to step 6.
NO	Inspect the wire harness. (Faulty B/Y wire)



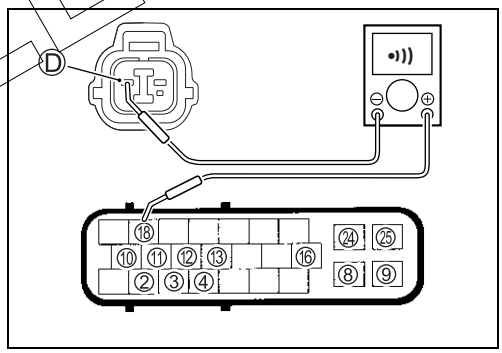
6) Check the continuity between Ⓓ (W/Y) and terminal ⑱.

DATA Normal value: Continuity (•)))

Tester knob indication: Continuity test (•)))

Is the continuity OK?

YES	Go to step 7.
NO	Inspect the wire harness. (Faulty W/Y wire)



SAMPLE

• Connect the rear wheel speed sensor coupler.

7) Connect three 1.5 V dry cells Ⓐ in series as shown and make sure that their total voltage is more than 4.5 V.
Measure the current between ⊕ dry cell terminal and ② (B/Y) on the ABS control unit coupler.

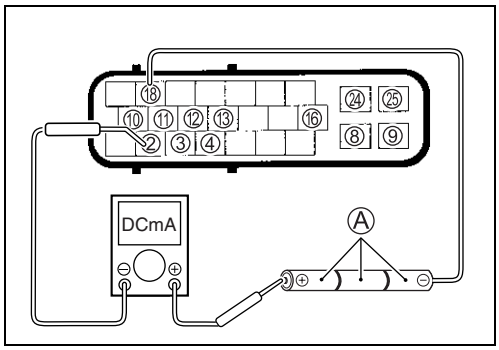
DATA Normal value: 3 – 14 mA

TOOL 09900-25008: Multi-circuit tester set
09900-25009: Needle pointed probe set

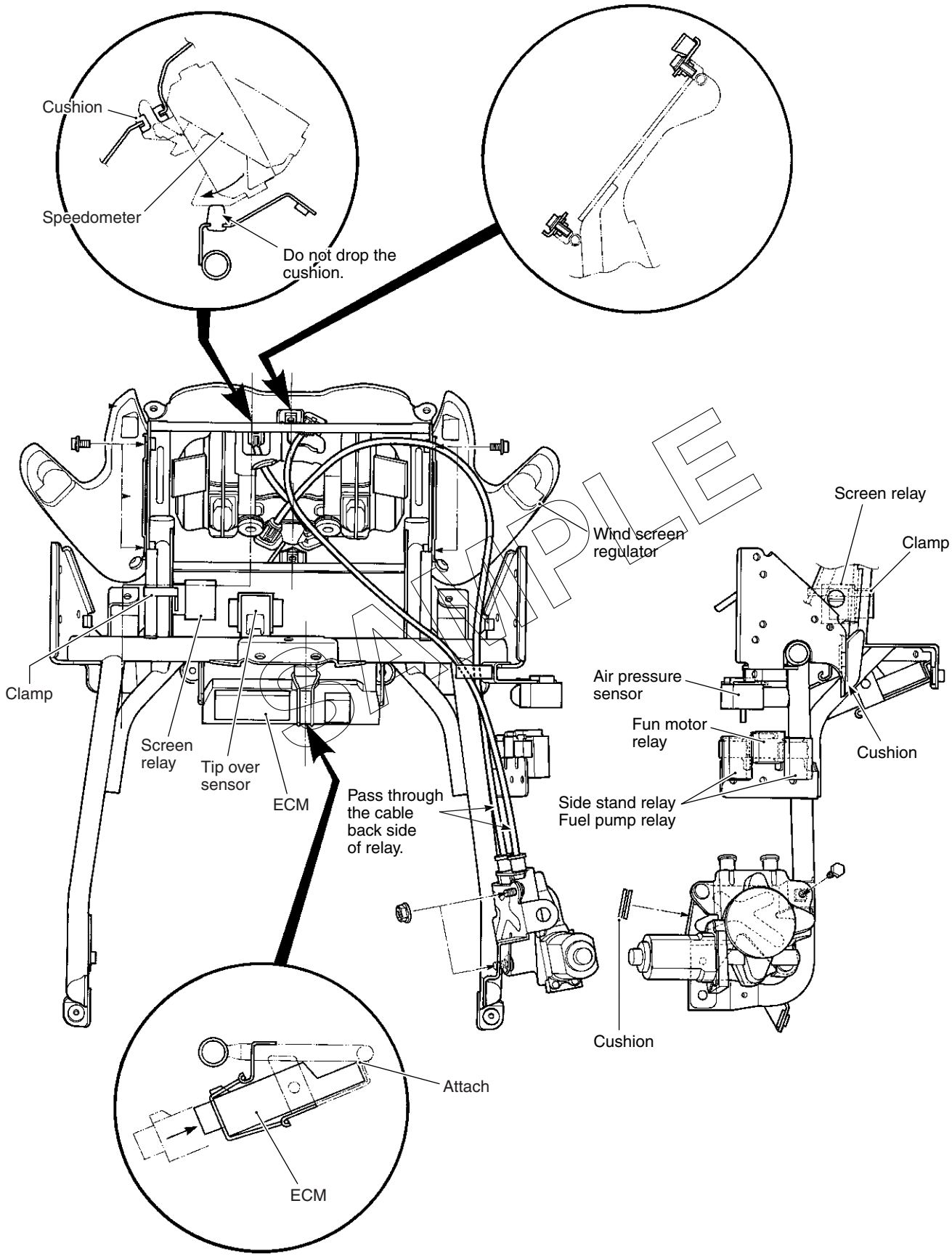
Tester knob indication: Current (⎓, 20 mA)

Is the current OK?

YES	Replace the ABS control unit/HU.
NO	Replace the rear wheel speed sensor.

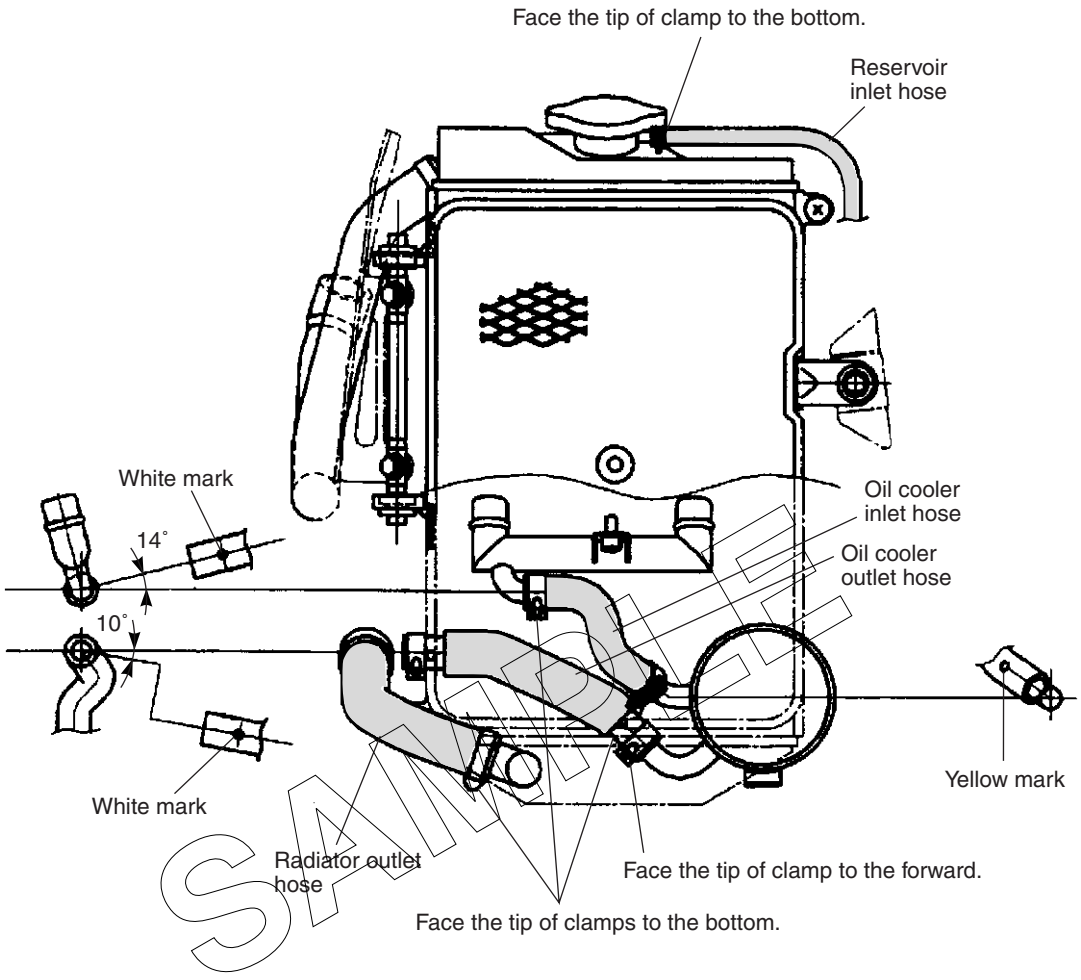


WIND SCREEN CABLE ROUTING



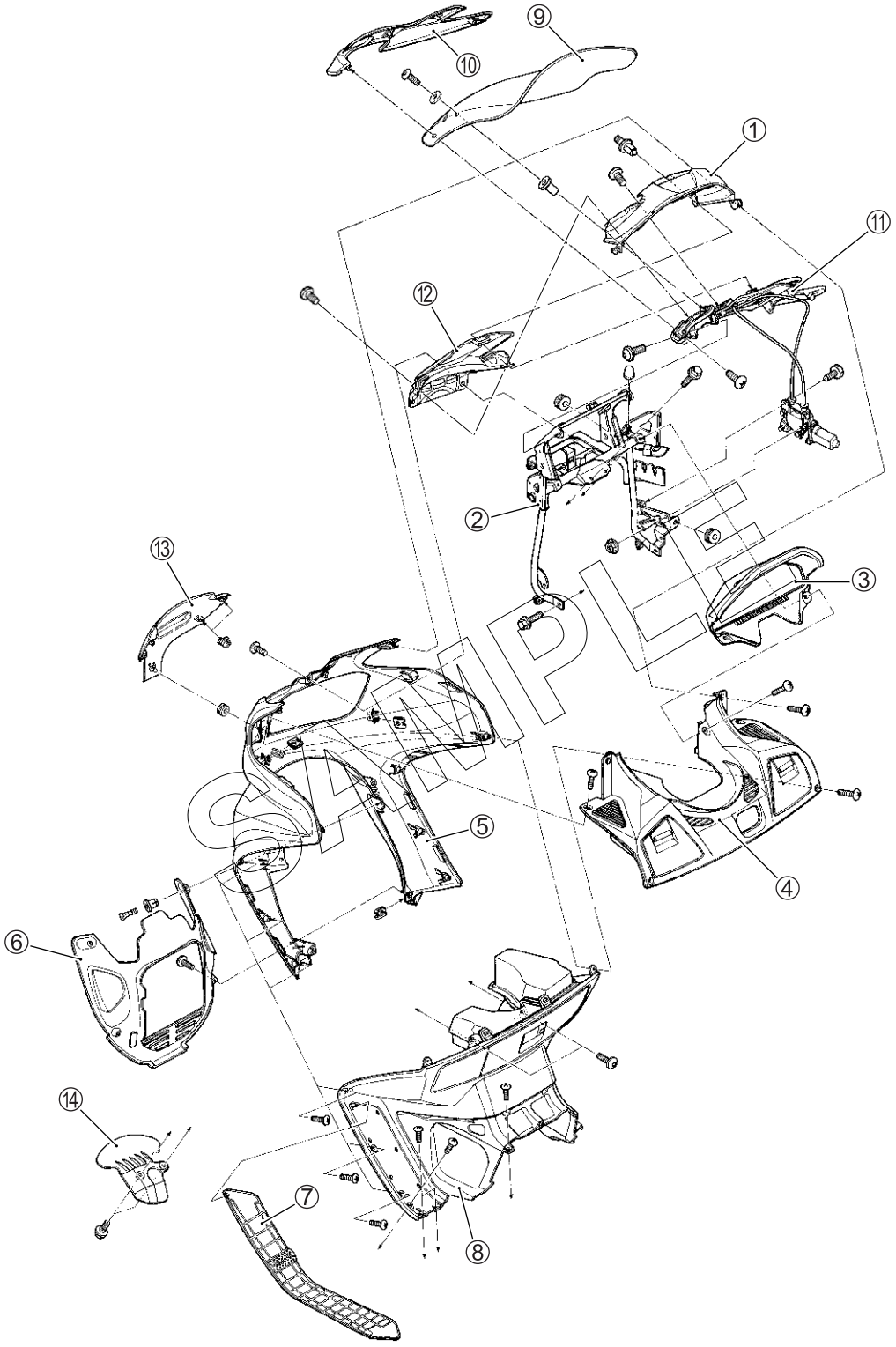
SAMPLE

RADIATOR HOSE ROUTING



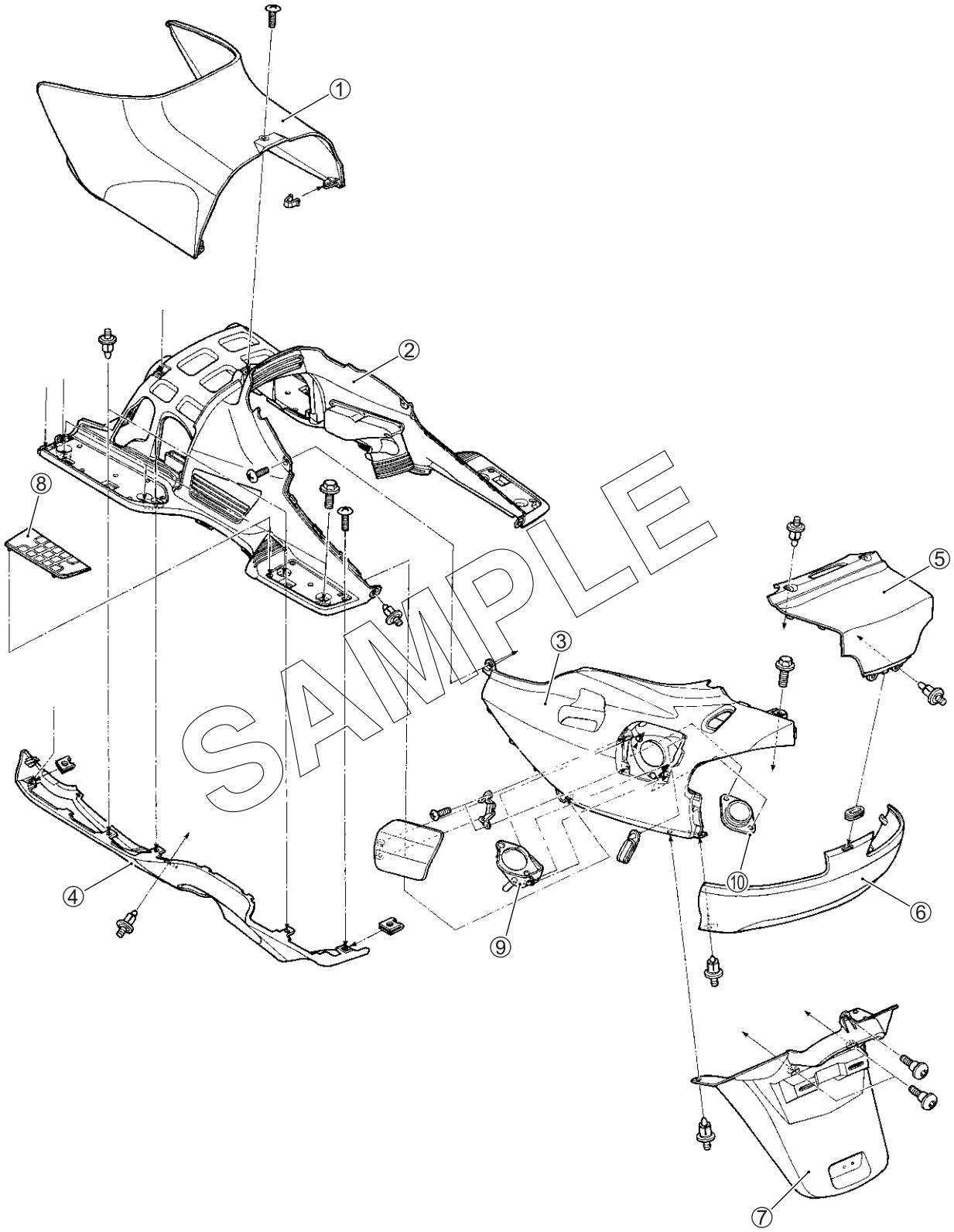
SAMPLE

EXTERIOR PARTS CONSTRUCTION



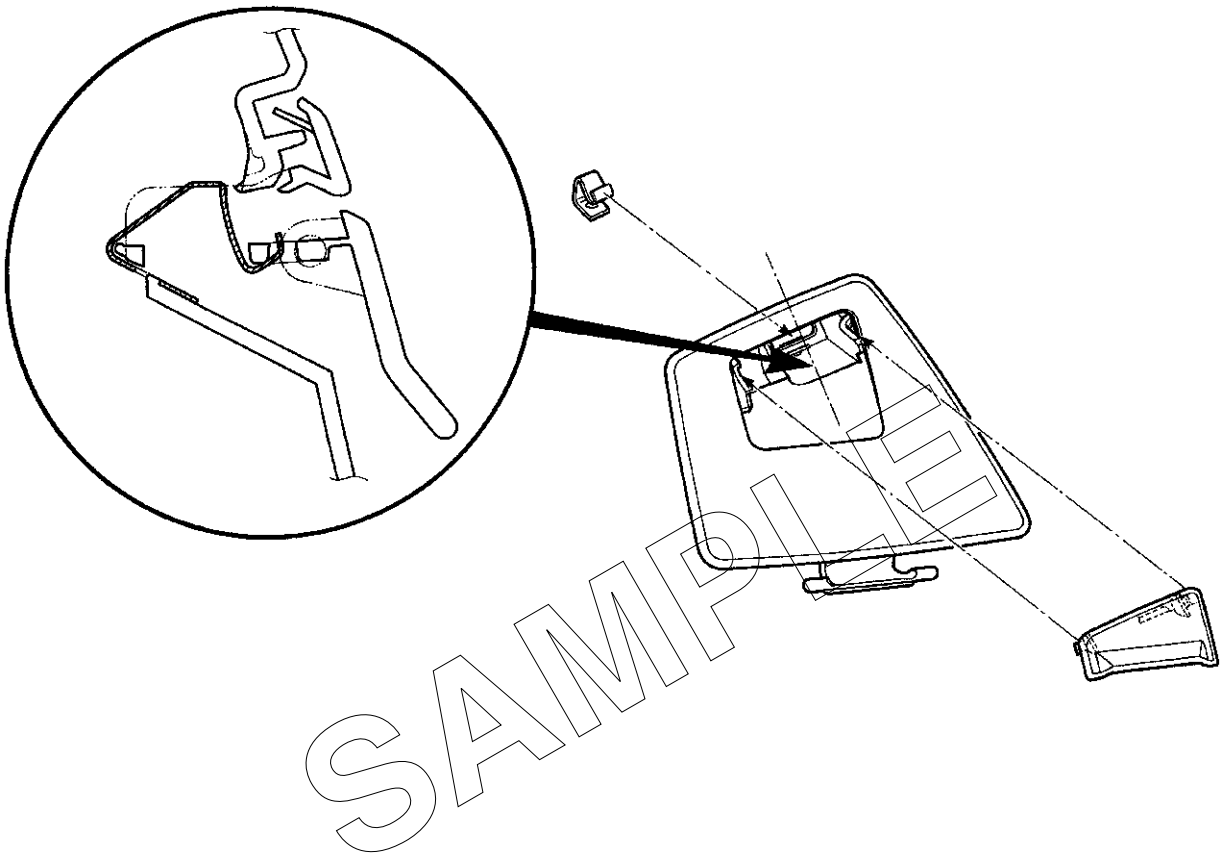
SAMPLE

①	Meter front upper panel	⑥	Lower leg shield	⑪	Wind screen regulator
②	Leg shield brace	⑦	Floor mat	⑫	Meter front lower panel
③	Meter cover	⑧	Front box	⑬	Front leg shield cover
④	Front panel	⑨	Wind screen	⑭	Lower bracket cover
⑤	Leg shield	⑩	Wind screen cover		



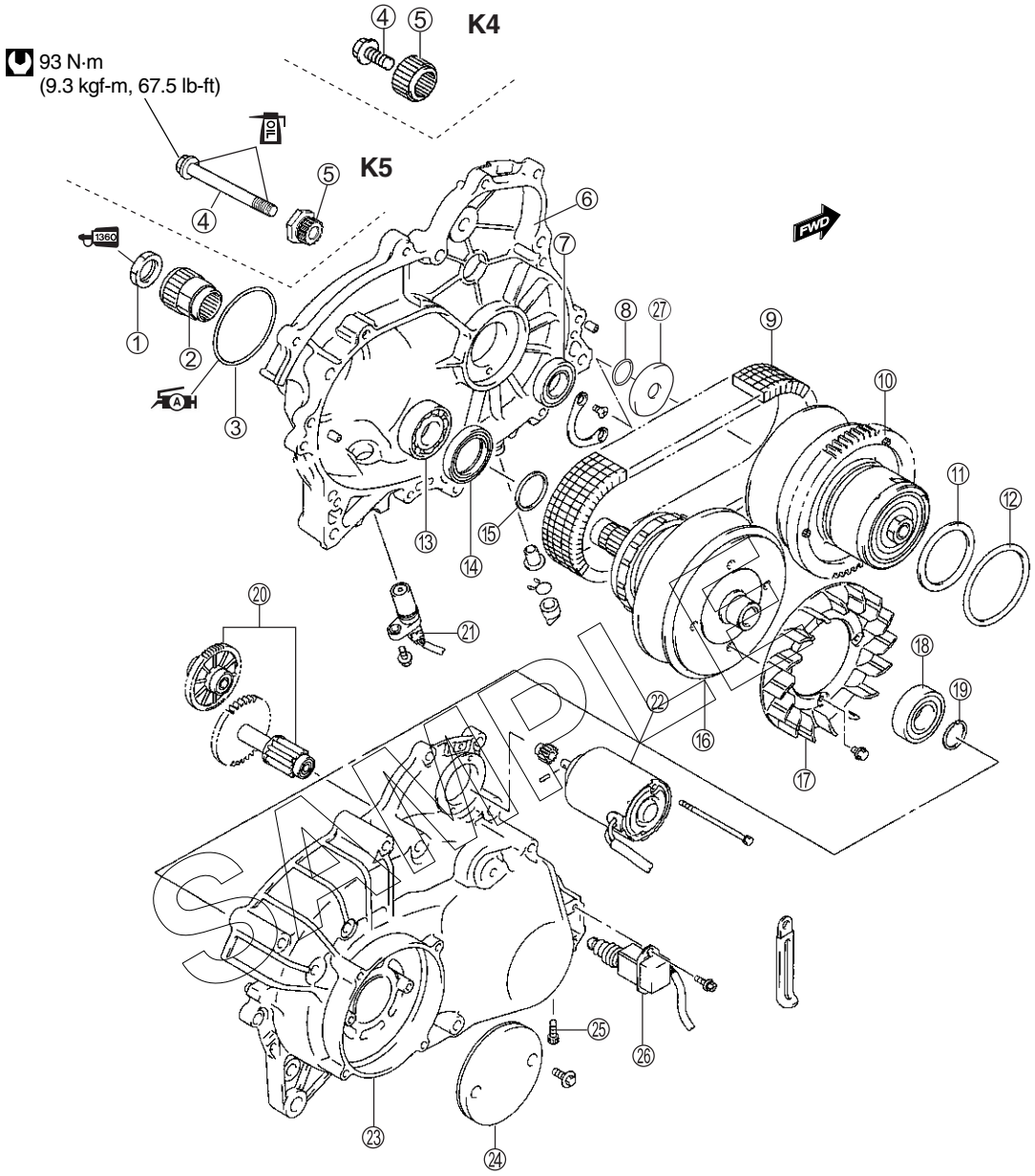
SAMPLE

①	Maintenance lid	⑤	Center frame cover	⑨	Fuel tank inlet tray
②	Foot board	⑥	Lower frame cover	⑩	Fuel tank inlet packing
③	Frame cover	⑦	Rear fender		
④	Leg side cover	⑧	Floor mat		



SAMPLE

CVT CONSTRUCTION



①	Secondary pulley shaft nut	⑨	CVT belt	⑰	Secondary pulley fan
②	Secondary pulley shaft adapter	⑩	Primary pulley assembly	⑱	Bearing
③	O-ring	⑪	Shim	⑲	Snap ring
④	Primary pulley shaft bolt	⑫	O-ring	⑳	Primary slide pulley idle gear
⑤	Primary pulley shaft adapter	⑬	Bearing	㉑	Secondary pulley revolution sensor
⑥	CVT casing	⑭	Oil seal	㉒	CVT motor
⑦	Bearing	⑮	Washer	㉓	CVT cover
⑧	O-ring	⑯	Secondary pulley assembly	㉔	CVT filter

• Use new special tool for ④.

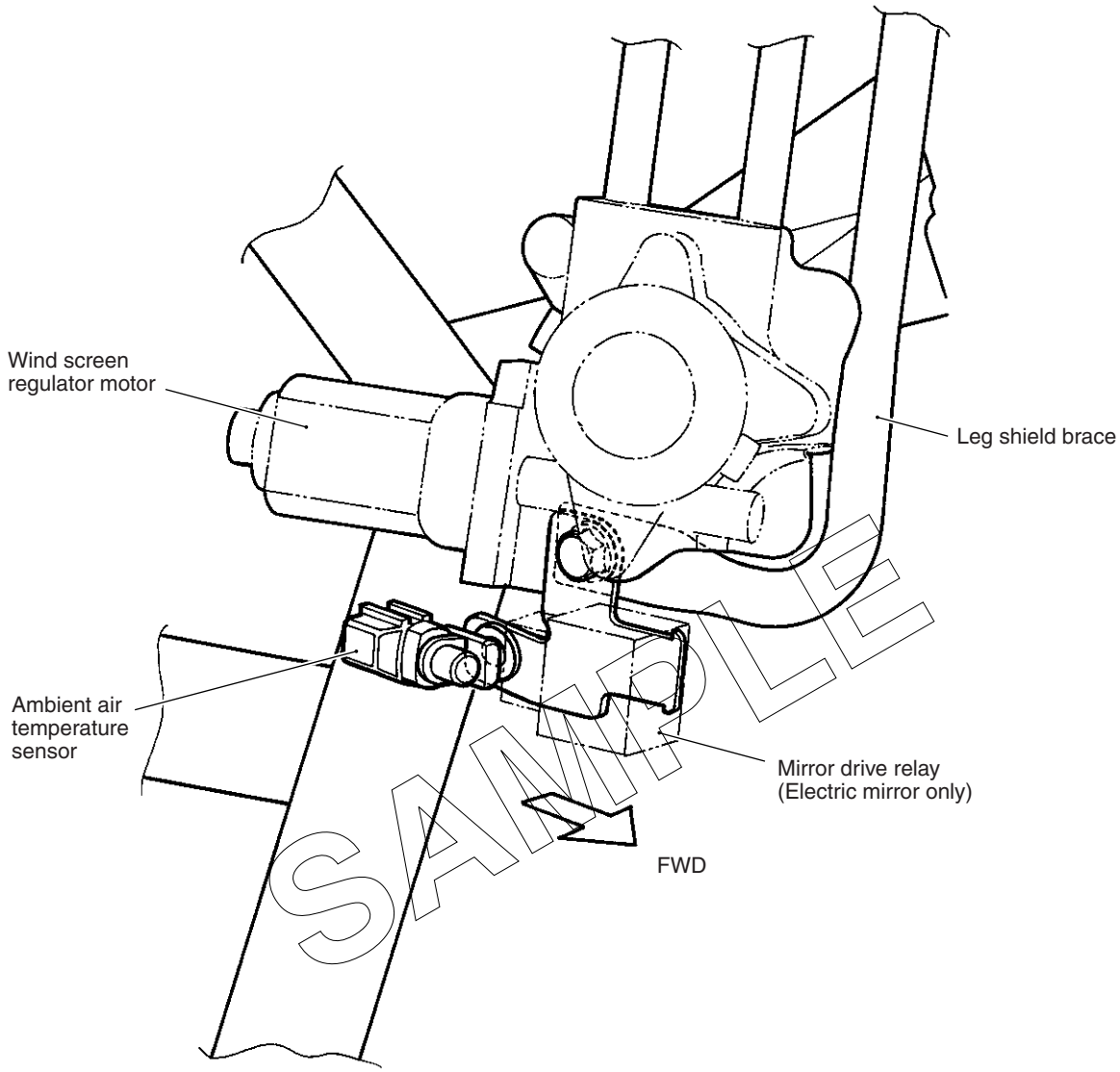
TOOL 09924-51010: Primary pulley shaft bolt holder

Primary pulley shaft bolt: 93 N·m (9.3 kgf-m, 67.5 lb-ft)

NOTE:

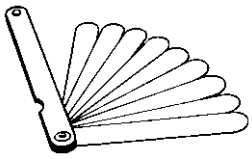
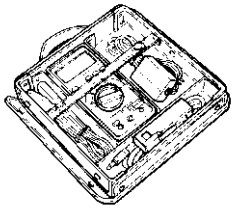
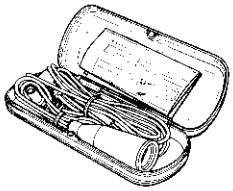
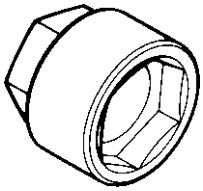
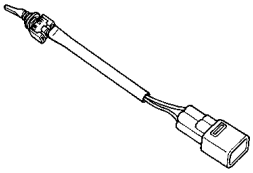
Do not reuse the removed primary pulley shaft bolt.

AMBIENT AIR TEMPERATURE SENSOR BRACKET INSTALLATION



SAMPLE

SPECIAL TOOLS

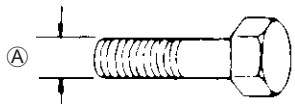
				
09900-20803 **09900-20806** **Thickness gauge**	**09900-25008** **Multi circuit tester set**	**09900-25009** **Needle pointed probe set**	**09924-51010** **Primary pulley shaft bolt holder**	**09930-82710** **Mode select switch**

TIGHTENING TORQUE CHART

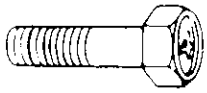
For other nuts and bolts not listed in the preceding page, refer to this chart:

Bolt Diameter Ⓐ (mm)	Conventional or "4" marked bolt		"7" marked bolt	
	N·m	kgf-m	N·m	kgf-m
4	1.5	0.15	2.3	0.23
5	3	0.3	4.5	0.45
6	5.5	0.55	10	1.0
8	13	1.3	23	2.3
10	29	2.9	50	5.0
12	45	4.5	85	8.5
14	65	6.5	135	13.5
16	105	10.5	210	21.0
18	160	16.0	240	24.0

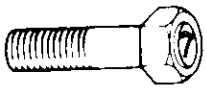
SAMPLE



Conventional bolt



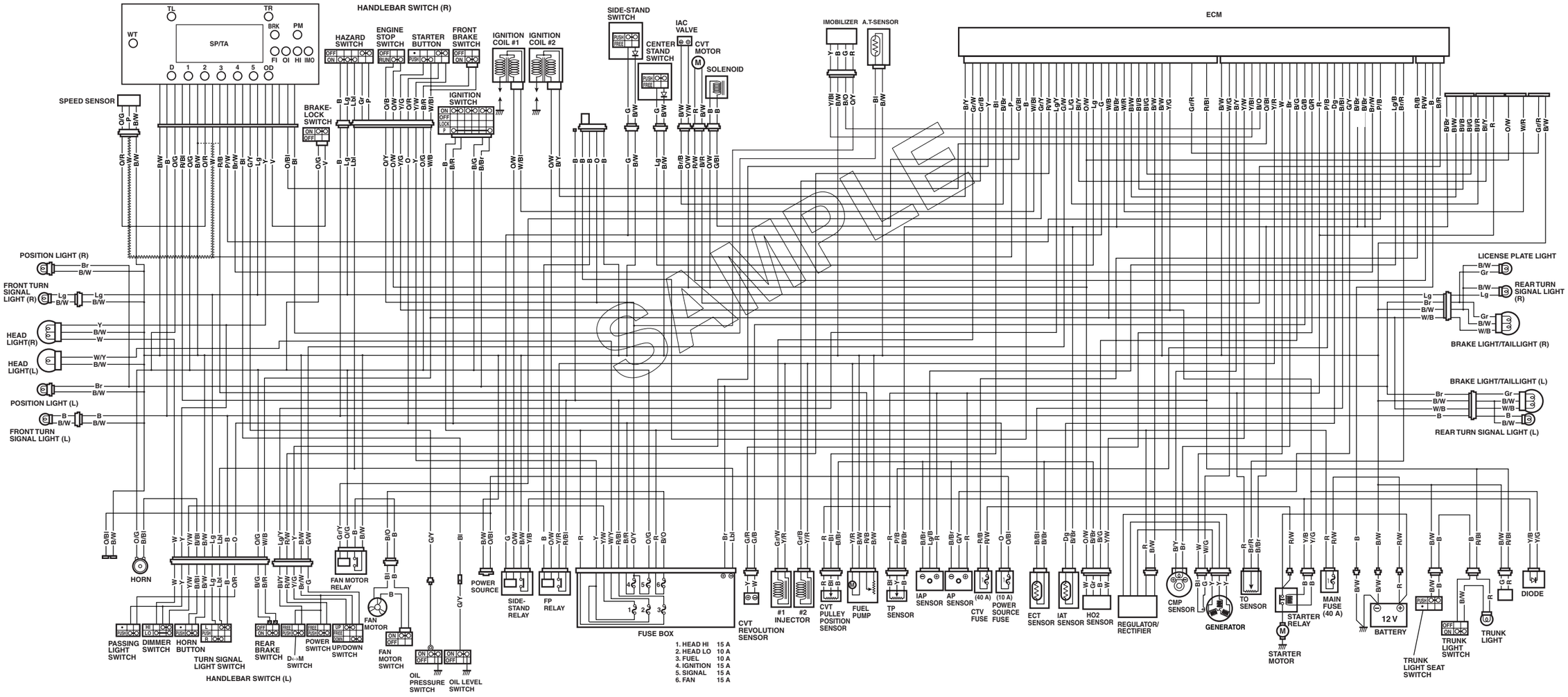
"4" marked bolt



"7" marked bolt

WIRING DIAGRAM
AN650K5 (E-02, 19, 000)

HI : HIGH BEAM INDICATOR LIGHT
OI : OIL PRESSURE INDICATOR LIGHT
FI : FI PILOT
BRK : BRAKE-LOCK INDICATOR LIGHT
TR : TURN SIGNAL INDICATOR LIGHT (R)
TL : TURN SIGNAL INDICATOR LIGHT (L)
WT : ENGINE COOLANT TEMP. INDICATOR LIGHT
D : DRIVE MODE INDICATOR
PM : POWER MODE INDICATOR
IMO : IMMOBILIZER
OD : OVER DRIVE INDICATOR LIGHT



AN650K5 (E-03, 24, 28, 33)

HI : HIGH BEAM INDICATOR LIGHT
OI : OIL PRESSURE INDICATOR LIGHT
FI : FI PILOT
BRK : BRAKE-LOCK INDICATOR LIGHT
TR : TURN SIGNAL INDICATOR LIGHT (R)
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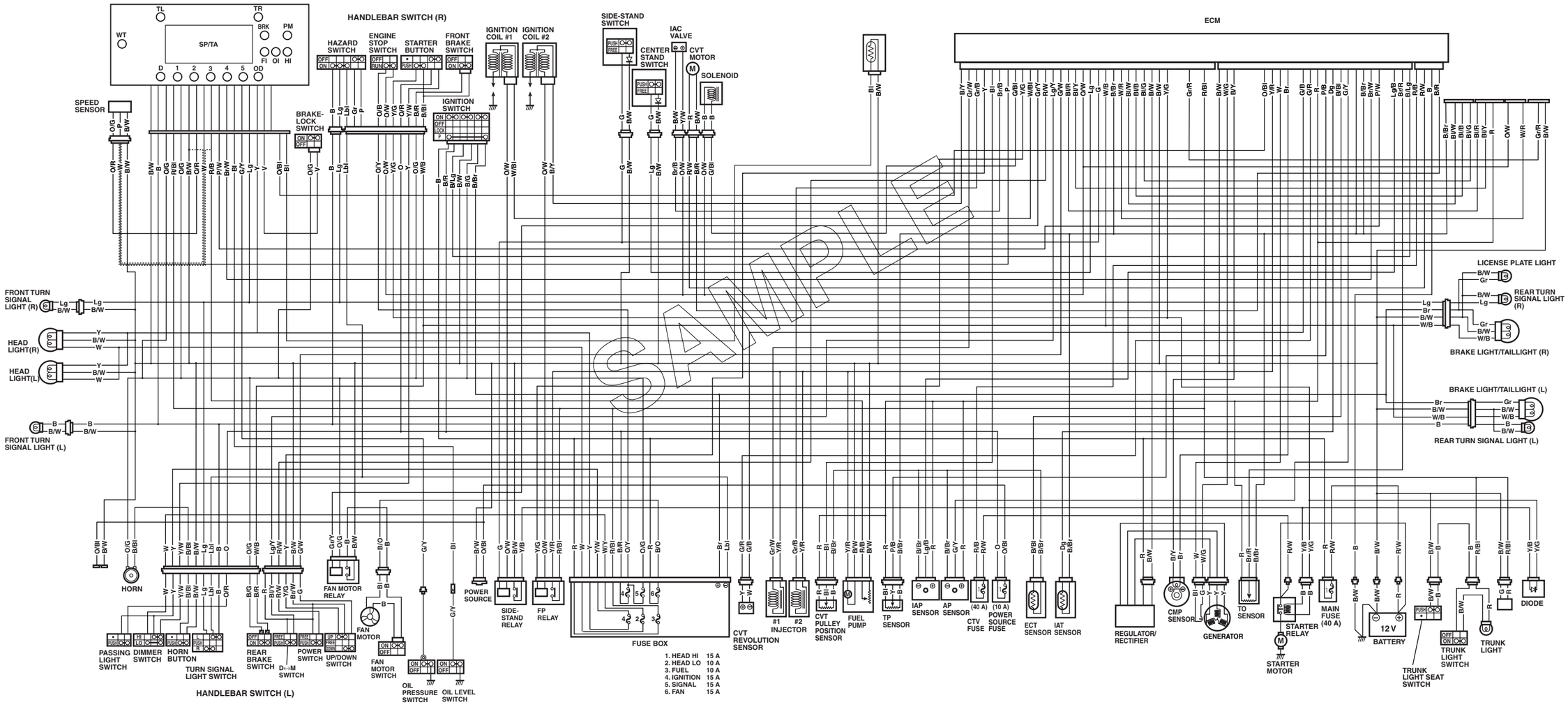
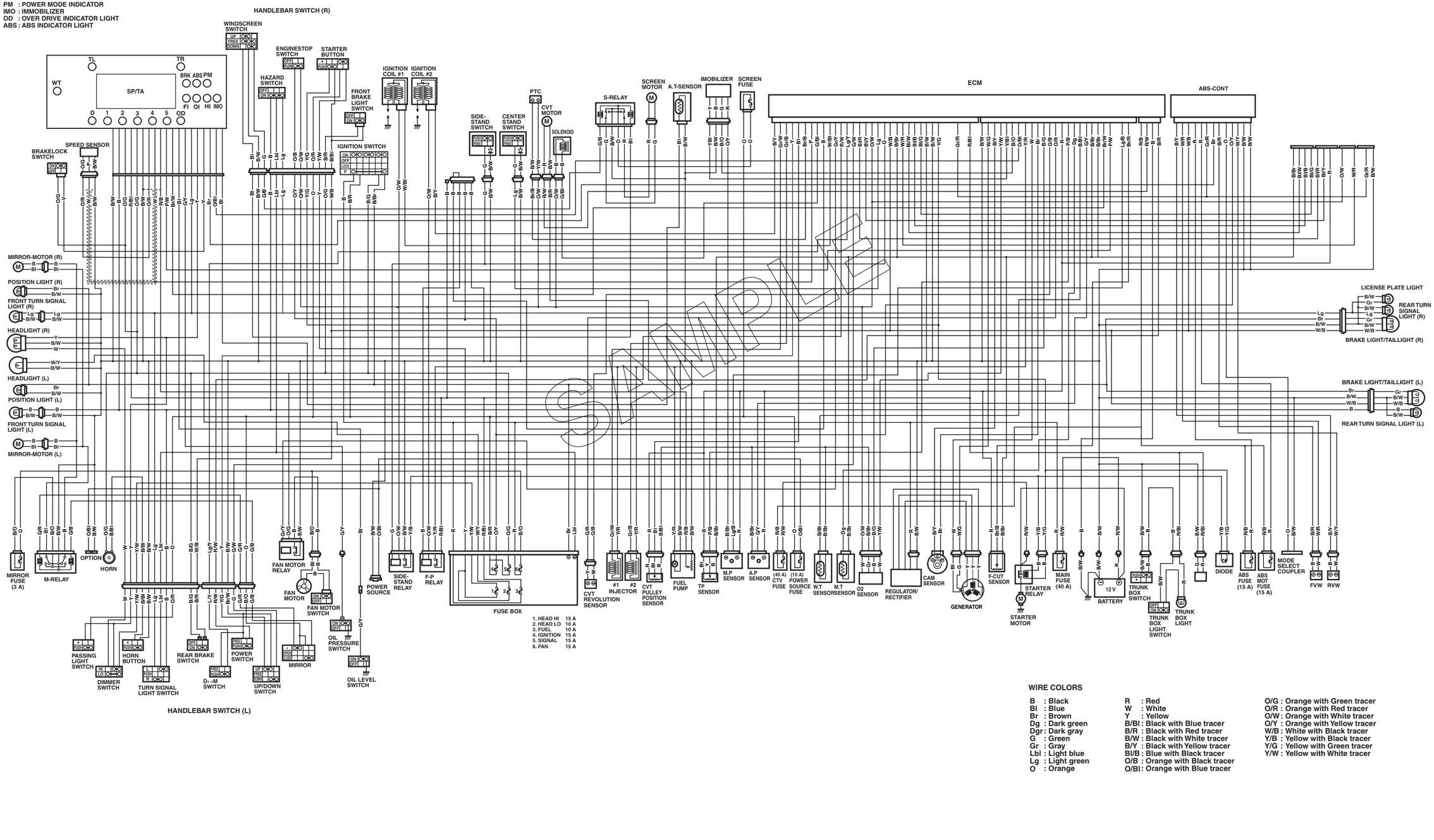


SAMPLE

AN650AK5 (E-02, 19, 000)

HI : HIGH BEAM INDICATOR LIGHT
OI : OIL PRESSURE INDICATOR LIGHT
FI : FI PILOT
BRK : BRAKE-LOCK INDICATOR LIGHT
TR : TURN SIGNAL INDICATOR LIGHT (R)
TL : TURN SIGNAL INDICATOR LIGHT (L)
WT : ENGINE COOLANT TEMP. INDICATOR LIGHT
D : DRIVE MODE INDICATOR
PM : POWER MODE INDICATOR
IMO : IMMOBILIZER
OD : OVER DRIVE INDICATOR LIGHT
ABS : ABS INDICATOR LIGHT



SAMPLE

WIRE COLORS

B : Black	R : Red	O/G : Orange with Green tracer
Bl : Blue	W : White	O/R : Orange with Red tracer
Br : Brown	Y : Yellow	O/W : Orange with White tracer
Dg : Dark green	B/Bl : Black with Blue tracer	O/Y : Orange with Yellow tracer
Dgr : Dark gray	B/R : Black with Red tracer	W/B : White with Black tracer
G : Green	B/W : Black with White tracer	Y/B : Yellow with Black tracer
Gr : Gray	B/Y : Black with Yellow tracer	Y/G : Yellow with Green tracer
Lbl : Light blue	Bl/B : Blue with Black tracer	Y/W : Yellow with White tracer
Lg : Light green	O/B : Orange with Black tracer	
O : Orange	O/Bl : Orange with Blue tracer	

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